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A REVIEW

OF

MINING OPERATIONS

IN THE

STATE OF SOUTH AUSTRALIA

DURING THE

HALF-YEAR ENDED JUNE 30TH, 1909.

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ISSUED BY T. DUFFIELD, J.P., *Secretary for Mines*,

UNDER THE AUTHORITY OF THE

HONORABLE E. H. COOMBE, M.P.,

Minister of Mines.

DEPARTMENT OF GEOLOGICAL SCIENCES,
UNIVERSITY OF TORONTO

Adelaide:
C. E. BRISTOW, GOVERNMENT PRINTER, NORTH TERRACE.

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MINERS' RIGHTS AND PRIVILEGES THEREUNDER.

A miner's right is obtainable at the Department of Mines, Adelaide, also at the issuing stations in the various mining districts, at a cost of 5s.

A miner's right is in force for one year from the date of issue, and may be renewed at any time during its currency for another term of one year on payment of 5s.

The holder of a miner's right is authorised to prospect on any mineral lands for any metal, mineral, coal, or oil, and to peg out (of the prescribed shape and dimensions) gold, mineral, coal, and oil claims, and also leases of a like nature.

AREAS AND WORKING CONDITIONS.

GOLD LEASES—Maximum area, 20 acres; working conditions, one man to every five acres.

MINERAL LEASES—40 acres; one man to every 10 acres.

MISCELLANEOUS LEASES—

Salt	640 acres;	special conditions.
Gypsum	640 "	one man to every 40 acres.
Mining Works	10 "	one man.
COAL OR OIL LEASES	640 "	one man to every 40 acres.
GOLD DREDGING LEASES	200 "	special conditions.
MINERAL CLAIMS	40 "	
GOLD CLAIMS	30ft. x 30ft., alluvial; 100ft. x 600ft., reef.	

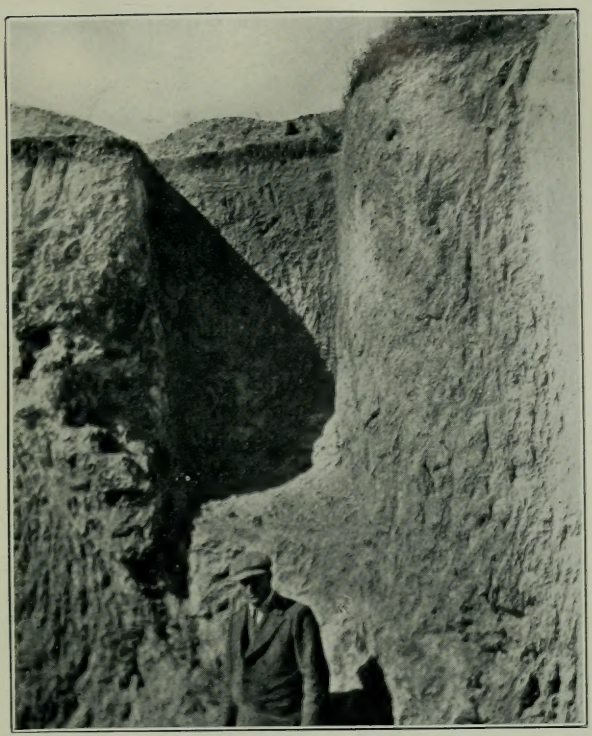
Gold claims must be constantly worked—one man for each claim—and mineral claimholders must employ two men for each claim. Amalgamation of either gold or mineral claims reduces the labor conditions by one-half.

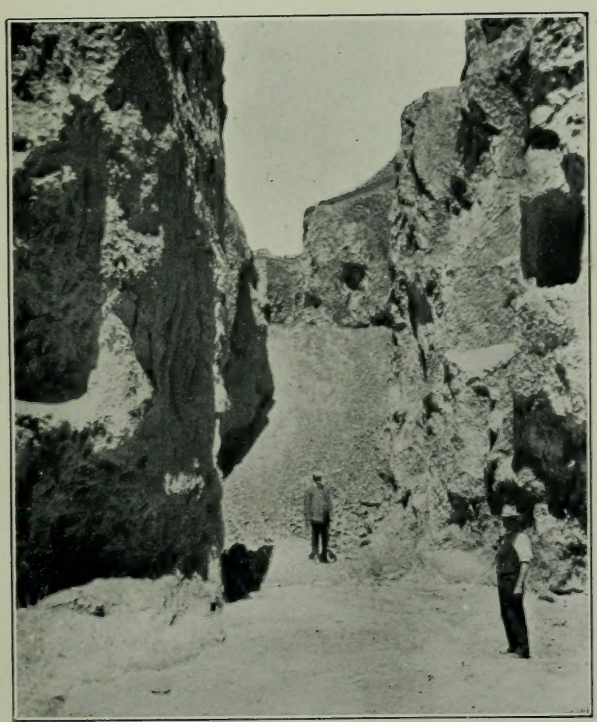
Gold, mineral, coal, and oil leases are granted for a term of 42 years—the two former at a rental of 1s. per acre per annum and a royalty of 6d. in the pound on net profits, the latter at a rental of 6d. per acre per annum until coal or oil is found in payable quantities, when 1s. per acre is payable and a royalty of 6d. in the pound on the net profits.

The Minister may permit, for the concentration of labor, of the amalgamation of not more than four adjoining gold or mineral leases.

Any number of gold, mineral, coal, or oil leases may be held by one person.

Licences to search for twelve months for precious stones, mineral phosphates, oil, rare metals, minerals, and earths are issued on specific mineral lands, not exceeding five square miles in area for one person, a fee of 20s. being charged for each square mile or portion thereof. These licences give a preferential right to a lease over a portion of the area, as prescribed.





ST. JOHN'S PHOSPHATE DEPOSIT.

(*Page* 2.)

PREFACE.

The average price of standard copper for the half-year has been under £60 per ton, and our copper mining operations have therefore been restricted. The industrial reaction in the United States, which it was confidently prophesied would succeed the recent disastrous monetary panics there, has not yet asserted itself, and until it does low prices may be expected in the copper market. Encouraging gold returns have been obtained from Glenloth and the North-East, the salt season has been a good one, and a fair amount of the local phosphate rock has been raised.

T. DUFFIELD, *Secretary for Mines.*

August 18th, 1909.

MINING OPERATIONS DURING THE HALF-YEAR ENDED JUNE 30TH, 1909.

AREA AT PRESENT HELD UNDER MINING ACTS (JUNE 30TH, 1909).

Nature of Holding.	Number.	Area.
Mineral leases	330	16,595 acres
Gold leases	90	1,665 "
Gold dredging leases	6	721 "
Miscellaneous leases	39	7,180 "
Mineral claims	397	13,101 "
Occupation licences	258	125 "
Search licences	52	33,280 "
Coal and oil claims	4	1,574 "
Total holdings	1,176	74,241 acres

REGISTERED FROM JANUARY 1ST, 1909, TO JUNE 30TH, 1909.

Mineral claims	94	2,937 acres
Gold leases	9	166 "
Mineral leases	3	120 "
Miscellaneous leases	1	10 "
Miners' rights	446	—
Search licences	25	26,240 "
Coal and oil claims	—	—
Total	578	29,473 acres

MEN EMPLOYED.

Number of men employed in mining and mineral works, June 30th, 1909—

Copper	4,550
Gold	920
Salt	470
Silver-lead	40
Other minerals	570
Total	6,550

REPORTS.

PROPERTIES REPORTED ON DURING THE SIX MONTHS ENDED JUNE 30TH, 1909.

By the Chief Inspector of Mines (W. H. Matthews).

	PAGE.		PAGE.
Day Spring, near Kersbrook	21	Wandilta	21

By the General Assistant (L. C. E. Gee).

	Page.		Page.
Commodore (Giles' Nob)	22	Lux	23

By the Inspector of Mines (H. Jones).

Anabama	26	Mary	27
Arkey Warren	31	Matheson's	32
Appealina	34	Mountain of Light	32
Black Eagle	31	Mount Burr	33
Belalie	33	Nil Desperandum	26
Cutana	25	New Milo	28
Copper King	31	Nectar	28
Copper Queen	31	Nuccaleena	31
Gunyah	23	O'Donnell's	32
Gun	24	Proposed Smelters at Beltana	30
Great Southern	29	Poona	33
Green Hill	32	Queen Bee	27
Harvey's Return	31	Spanish-American	25
Hill's Claim	31	Trinity	26
Holmes' Claim	32	Uncle Tom	27
Hamley	34	Victory	33
King's Bluff	25	Winckler's Lead Show	27
" Claims, near	25	Warra Warra	30
" Monazite Show	25	" West	32
Lux	27	Warrioota	31
Mount Gunson	24	Wild Dog	32
Mutooroo	27	Yorke Valley	28

GENERAL NOTES.

The average price of standard copper for the six months has been £58 11s., and the range of price has been—highest, £64 2s. 6d., January 6th, and the lowest, £54 18s. 9d., March 17th. The quotation of June 30th was £59 5s.

Copper mining operations have therefore been considerably restricted, nor may vigorous developmental work in the known mines be expected until the price steadies at a higher figure ; and outside prospecting has of course been also affected.

The Wallaroo and Moonta Mines have produced 2,858 tons of copper. Operations have consisted of mining work on various lodes, veinstuff hauled to surface, crushed, sorted, and concentrated by special machinery or treated chemically ; the products being forwarded to Wallaroo for smelting and refining.

A little work by tributers has been done on the Kapunda Mine.

At the Kitticoola (Reedy Creek) Mine exploration work only has been done, chiefly in the lower levels sulphide zone. Level driven at 420ft. level a distance of 230ft. A level S. at 360ft. level 200ft. The 180ft. level N. extended 100ft. Three test rises at 180ft. level N. An adit 170ft. long driven to intersect lode known as the Cottage Lode.

The smelting works of the Union Copper Company at Yudnamutana are practically completed, and will be in operation before long. Considerable quantities of ore have been raised on the company's various holdings in the district, and a policy of exploratory development is being followed.

This company has imported a Renard Road Train, consisting of a motor engine and four 6-ton trucks. Satisfactory trial runs have been made between Farina and Yudnamutana.

At the Paringa and West Kanmantoo Mine a milling plant has been erected for the purpose of concentrating the ore.

No work is in progress at the Burra Burra.

The Hamley Company has been equipping the Karkarilla Mine with new hauling plant, repairing shaft and levels, making new skip road, and carrying on development at 240ft., 300ft., 360ft., and 420ft. levels.

The Inspector of Mines has furnished an encouraging report on the Belalie Copper Mine, which will be found on page 33. This mine was originally known as the Wheal Sarah ; not much work was done on it in the old days, but it was stated that specimens of the ore exhibited in Green's Exchange in 1858 ran to 50 per cent. for metallic copper.

The Parara Copper Mine, near Ardrossan, has been let to a party of tributers.

No ore has been sent to market from the extensive deposits at Mount Gunson and Pernatty, owing to the low price ; the ore has to be carted 80 miles to Port Augusta over a heavy road.

At the Government Copper Mine, Wandilta, operations are proceeding satisfactorily, and various tributes have also been let. Reports will be found on pages 16 and 21.

At Mount Grainger Messrs. Jones Bros. at the N. portion of the Grainger lease, working on tribute on a formation consisting of ferruginous clayslate, quartz, gossan, and ironstone, which appears to strike parallel to the Grainger lode, have successfully continued their operations, and have up to date had treated at the Petersburg Government Cyanide Works 60 tons 5cwts. of ore for 238ozs. 7dwts. 17grs. of gold, valued at £949 10s. 3d., and in addition have some bags of specimens which will give rich returns by dolly.

The Mount Grainger main shaft had reached a depth of 310ft., making water at the rate of about 4,000galls. per diem, when work on it was suspended.

From the Dustholes a parcel of 6 tons 17cwts. gave 3ozs. 3dwts. 2grs. gold valued at £11 19s. 2d. This is from a large auriferous lode or bed situated about 2 miles N.W. from Mount Grainger; it strikes about N.E., dips W., will probably average about 25ft. in width, and consists mainly of sandstone intersected by numerous quartz veins of varying size, which generally strike across the sandstone and dip to the S. It can be traced on the surface for over a mile, and has never yet been tested at depth. The total of the trial parcels treated so far is 144 tons 17cwts., returning 58ozs. 10dwts. 21grs. of gold, valued at £211 5s. 7d., the ore being therefore worth 29s. per ton.

The Inspector of Mines states that from information gathered regarding various wells in this locality he considers that a good supply of water could be obtained at from 140ft. to 150ft. in depth.

All the evidence available so far concerning Mount Grainger and the Dustholes points to the conclusion that they may be at any rate fairly classed as large low-grade shows which, with capital and up-to-date treatment, should be made to pay handsomely.

Full and interesting official reports on these properties will be found on pages 214, 248, and 250, Government Record of Mines, and page 27, Review No. 8.

A parcel of stone from the old Nectar claim near Mannahill, weighing 3½ tons, treated at the Petersburg works, yielded 6ozs. 4dwts. 3grs. of gold, worth £23 7s. 5d., the stone being worth 133s. per ton. A parcel of 2 tons 12cwts. from the same place treated during the last half-year gave 8ozs. 8dwts. 14grs. of gold, worth £32 14s. 4d., or 152s. per ton; the total being 6 tons 2dwts. for 14ozs. 12dwts. 17grs. of gold, valued at £56 1s. 9d.

The belt of auriferous reefs, known as the Mannahill Reefs, was discovered at the end of 1885; they were prospected in a desultory pothole sort of way in 1886-7, before the days of cyanide, and practically no work has been done on them since, except near the Homeward Bound on the W. side.

The results of the parcels mentioned, although the stone was most probably picked, are very interesting and satisfactory, and it is to be hoped that attention will again be called to this long-neglected field. Full information concerning the place and the old workings will be found in the Record of Mines, pages 238 to 248.

Some good stone has been obtained of the Lux Mine, 15 miles E. from Olary; 76 tons 12cwts. yielded, at the Government works, Petersburg, 72ozs. 17dwts. 15grs. of gold, valued at £265 19s. 6d.

King's Bluff Mine has not yet got into proper work; there is now abundance of water, and the company, which had not enough capital, is being reconstructed. The crushing of 244 tons of stone from the shaft and dumps gave 185ozs. of gold.

The Glenloth field continues to develop satisfactorily, the battery returns for the six months showing 343½ tons treated for 424ozs. 2dwts. 22grs. of gold, valued at £1,452, the stone being worth 83s. per ton. The total work done by this battery up to date is 1,774 tons for 1,576ozs. of gold, worth £5,353.

The New Glenloth Company has raised from Fabian's No. 3 136 tons, yielding 122½ozs. of gold, valued at £418, making the total obtained so far from Fabian's 443 tons for 503ozs. 16dwts. 15grs., worth £1,475 0s. 3d., or 66½ shillings per ton.

From the Lone Hand (Simmons and Kavanagh's claim) 144 tons were treated for 261ozs. of gold, worth £898 14s. 8d., or 125 shillings per ton.

At Tarcoola the Blocks Company has crushed 185 tons for 383ozs., value £957. The total return from this mine shows 27,033 tons of stone for 37,611ozs. of bullion, worth £116,570, or 86 shillings per ton.

Since the reconstruction of the company developmental work at the 250ft. level, main shaft, has been in progress.

The only parcel treated at the Tarcoola Government battery was from the Government mine, sent in by a tributer, 5tons 5cwts., returning 35ozs. 4dwts. 12grs., worth £114 7s. 6d.

The totals to date of this battery show 2,056½ tons for 2,544ozs. 16dwts. 8grs., worth £8,987 9s. 2d., or 87½ shillings per ton.

Prospecting seems practically at a standstill in this locality at present, and nothing has been done on the new reef found by Bartlett, about 5 miles S. of Tarcoola.

The Government prospecting party examining the country to the W. of Tarcoola discovered an auriferous reef near Muckanippie Rockholes, about 42 miles N.W. from Tarcoola. The reef is about 5ft. wide, and was completely covered with loam and limestone, except one outcropping stone ; it consists of solid quartz stained with ironstone, and in parts there are small streaks of liver-colored iron. A shaft has been sunk to a depth of 30ft. and the cap of the reef exposed for 50ft. along the line of strike. From numerous samples the value of the reef from top to bottom is estimated at from 4dwts. to 5dwts. of gold per ton. This reef is indicated by floaters for 30 chains along the line of strike, and most of them dolly a little gold, but none indicate that the reef is richer at any other point than where it is opened up.

Despite the fact that the particular reef struck seems very low in gold value this find is important, inasmuch as it greatly extends the known gold-carrying area in the Tarcoola district and enhances the probabilities of the future. There is a very large extent of auriferous country in the neighborhood of Muckanippie not even looked at yet, and in order to aid prospectors the Government has sunk a well not far from this reef.

A new find of gold in the hills district, between Chain of Ponds and Williamstown, was made recently near Kersbrook ; stone from it weighing 18 tons 17cwts. treated at the Mount Torrens Government battery returned 61ozs. of gold worth £223 14s. A detail report on the find by the Chief Inspector of Mines will be found on page 21.

The Garden Gully Company at Moppa has sunk a new shaft 42ft. and driven to meet No. 1 shaft, about 138ft. distant, and ore is being stoped out for treatment. Several chains of water-races have been constructed for sluicing purposes.

The Onkaparinga Dredging and Mining Company has erected a sluicing plant at Biggs' Flat and commenced operations.

Mining for alluvial gold has been intermittently in progress for some time on section 996, hundred of Barossa, in a Tertiary deposit of sand, gravel, &c., forming the capping of a hill. The place was known as the Gordon Reward, and official reports on the gold workings will be found on pages 209, Record of Mines, and 24, Review No. 8. Some of the wash was recently submitted to Mr. D. Mawson, of the Adelaide University, and he detected in it some fragments of corundum and various small gem stones. A visit was paid to the locality and special samples of the wash obtained ; these were examined by Mr. Mawson, who reports as follows :—

" About 1cwt. of wash was concentrated to about 2lbs. This concentrate contains smooth, clear pebbles of brilliant quartz, one of which shows an *amethystine* color, abundance of crystal *rutile*, and a quantity of black *tourmaline*. A notable amount of both coarse and fine gold was separated with difficulty from the heavy gravel.

"Special attention was given to the occurrence of gem stones, and the following were isolated:—Ten fragments of rough *corundum*, weighing in all 2ozs.; two fragments, weighing ¼ carat of *sapphire*; numerous small fragments of *cyanite*, averaging ⅛ carat; eight fragments, weighing an average of ¼ carat of a mineral resembling *tiger's eye*; in this the optical effect producing the appearance of tiger's eye appears to be due to numerous fine parallel hairs of *rutile* embedded in quartz; eight fragments, averaging ⅛ carat of yellowish-green *chrysoberyl*; four fragments, averaging ⅛ carat of *golden topaz*.

"From amongst a lot of stones picked out by the men from the dumps was one clear gem, quality of pale *ruby*, weighing ½ carat, also two smaller fragments; two pieces weighing about ½ carat of *aquamarine*; a flat chip weighing about 1 carat of *asteria sapphire*; about 30 small fragments up to ½ carat of *chrysoberyl*; some 20 small pieces of *golden topaz*; one brilliant *white topaz* weighing 1 carat; one fragment of *aventurine*; numerous small fragments of *cyanite*; several pounds of rough bluish *corundum*.

"The only stones in the above of commercial value as gems are the ½ carat *ruby* and the 1 carat *white topaz*.

"Two other *rubies*, one weighing 1 carat the other ¾ carat, were reported earlier; these also are of commercial value."

There are many of these Tertiary deposits in the hundred of Barossa, and attention was called to them in 1889 by the Government Geologist, who published a map showing their positions and explanatory notes concerning them.

The present discovery of gem stones in the wash is very interesting, and it is to be hoped that the future may bring finds of economic importance.

Attention has been called to the fact that a number of diamonds were found at Echunga in the early days. Interesting articles have appeared in both of the Adelaide newspapers and good cause shown for a systematic search in the Echunga district.

Vigorous operations are in progress at the Commonwealth (Wheal Ellen) Mine, near Strathalbyn, and developments continue satisfactory. A total of 1,310 tons has been put through the battery for 262ozs. 8dwts. of gold, worth £847; the ore was taken from the stopes in the vicinity of the gossan shaft above the 130ft. level, about 6 tons of high-grade carbonate of lead ore was also obtained. This shaft, the N. or gossan shaft, was also unwatered to the 180ft. level, where gossan ore is showing up to 8ft. in width. A nice shoot of auriferous gossan ore has also been met with at the back of the 130ft. level, about 80ft. N. of the main shaft. The company dispatched 12 tons of pyrites assaying about 49 per cent. sulphur to sulphuric acid manufacturers as samples, with the result that negotiations for the sale of 5,000 tons are practically completed, The main shaft has been partially unwatered, the water level now standing at 240ft., and at this point levels were found to have been driven N. and S. on the lode for a distance of 200ft., with a zinciferous galena lode 18in. thick showing for 160ft., assays from which gave—gold, trace to 2dwts.; silver, 6·2ozs. to 12·2ozs.; lead, 15·5 per cent. to 18·8 per cent.; and zinc, 24·5 per cent. to 27·4 per cent. A large body of iron pyrites has been developed in the vicinity of the main shaft; it has been proved for a length of 45ft. and treated in 130ft., 150ft., 200ft., and 240ft. levels. Crosscuts put in

at the 150ft. and 200ft. levels showed the lode to be 11ft. wide of solid pyrites. This fine body is still going underfoot at the 240ft. level and large supplies may be anticipated from it. Five samples from the different levels assayed 48 per cent. to 50·8 per cent. sulphur.

The Ediacara Silver-Lead Mine has been unworked during the six months, but operations are now being resumed.

A large and promising silver-lead show, near Giles' Nob in the N.E., about 30 miles from both Mannahill and Olary railway stations, has been opened up again, after having been deserted for over 20 years. It was originally called the Prince Albert but has now been named The Commodore ; an official report concerning it will be found on page 22. The work in hand here now is driving from the 80ft. shaft, stoping from the 40ft. shaft, and sinking an air shaft to connect with drives. No ore has yet been marketed.

The Kangaroo China Stone and Clay Company has continued energetic operations, both at their works at Hog Bay and at the mine at Chinatown. The staff has been well-occupied manufacturing fire-resisting material for orders received, and, with the assistance of an expert, have carried on experiments with the object of still further improving their manufactures. Some high-class roofing tiles have been made from various mixtures of their valuable clay deposits, and a large quantity of building bricks have been made to supply the local demand.

About 12 tons of high-grade yellow ochre have been raised from the ochre mine near Oodlawirra railway station and forwarded to Melbourne.

The attention of prospectors and speculators in the eastern States has been called to the carnotite find near Olary. Samples have been obtained, the ground has again been taken up, and it is stated that the original shaft —70ft. —is to be continued.

Owing to the Broken Hill labor disputes no work has been done at the Iron Knob quarries, or at the limestone flux quarries.

Returns show that about 3,300 tons of phosphate rock have been raised.

The salt-scraping season on Yorke Peninsula has been a good one, and returns show about 50,000 tons obtained.

COPPER.

AVERAGE MONTHLY PRICE OF COPPER, JANUARY-JUNE, 1909.

	Standard. £ s. d.		Best Selected. £ s. d.
January	61 6 8	..	65 6 3
February	57 18 9	..	61 6 3
March	56 6 9	..	60 4 5
April	57 9 1	..	60 19 0
May	59 9 8	..	62 16 3
June	59 15 0	..	62 15 7
Average for the six months	58 11 0	..	62 4 7

RANGE OF PRICES—

January 6th	64 2 6
March 17th	54 18 9

AVERAGE PRICE OF STANDARD COPPER FOR THE LAST TEN YEARS.

	£ s. d.		£ s. d.
1899	73 13 9	1904	59 0 7
1900	73 2 5	1905	64 16 10
1901	66 19 1	1906	87 8 10
1902	52 8 3	1907	82 1 11
1903	58 3 2	1908	60 0 10

Average for the 10 years, £67 15s. 6d.

CRUSHING AND CYANIDING PLANTS.

RETURNS FROM GOVERNMENT CRUSHING AND CYANIDING PLANTS FOR THE HALF-YEAR ENDED JUNE 30TH, 1909.

Name of Mine.	Locality.	Ore Treated. Tons cwts. qrs.	Total Gold Recovered. Ozs. dwts. grs.	Value. £ s. d.	Average Yield per Ton, in Shillings.
MOUNT TORRENS.—GOVERNMENT BATTERY AND CYANIDE PLANT.					
Day Spring	Kersbrook	4 10 0	15 2 4	59 14 2	265
Mount Torrens	Mount Torrens	3 7 0	0 18 17	3 9 2	20½
Do. (sands only)	"	20 0 0	0 12 12	2 10 0	2½
Day Spring	Kersbrook	14 7 0	45 17 20	183 19 10	256
Durdan Extended	Blumberg	23 10 0	5 1 10	19 5 2	16
Mount Torrens	Mount Torrens	Specimens	4 14 3	18 16 6	—
Total		65 14 0	72 6 18	287 14 10	87½
Grand total since starting of battery		9,162 16 3	5,232 5 14	19,765 0 6	43

RETURNS FROM GOVERNMENT CRUSHING AND CYANIDING PLANTS—*continued.*

Name of Mine.	Locality.	Ore Treated.	Total Gold Recovered	Value.	Average Yield per Ton, in Shillings.
		Tons cwts. qrs.	Ozs. dwts. grs.	£ s. d.	
PETERSBURG.—Government Battery and Cyanide Plant.					
Mount Grainger	Mount Grainger ..	12 5 0	112 3 3	446 14 11	729
Lux	Olary	5 10 0	9 4 7	36 17 0	77
Lux	"	30 0 0	34 18 0	125 6 2	83
Mount Grainger	Mount Grainger ..	24 0 0	89 11 14	356 14 1	297
Homeward Bound ..	Mannahill	4 14 0	12 2 4	47 5 0	201
Nectar	"	3 10 0	6 4 3	23 7 5	123
Lux	Olary.....	41 2 0	28 15 8	103 16 4	50
Mount Grainger	Mount Grainger ..	24 0 0	36 12 0	146 1 3	122
New Milo	Wadnaminga	8 10 0	7 2 15	25 19 10	61
Homeward Bound ..	Mannahill	4 9 0	13 11 21	53 19 3	242½
Dustholes	Mount Grainger ..	6 17 0	3 3 2	11 19 11	35
Total.....		164 17 0	353 8 5	1,378 12 2	167
Grand total since starting of battery ..		3,781 1 0	3,599 15 20	13,363 12 2	70⅔

The Petersburg and Mount Torrens Battery and Cyanide Works are worked alternate months by the one staff. A summary of the work done for the year ending June 30th, 1909, shows that 766 tons of ore tailings and concentrates have been treated, the gold resulting, viz., 573ozs. 9dwts. 12grs., valued at £2,239 5s. 10d. Of this amount £2,051 has been returned to the prospectors as proceeds on the various parcels. In addition to the foregoing, 342 assays and amalgamation tests of small parcels of a few pounds weight have been made.

GLENLOTH.—Government Battery.				
Parcel No. 28—New Glenloth Co. (Fabian's No. 3)	54 0 0	33 15 12	121 4 3	45
" " 29—McMahon and Collins.....	8 0 0	3 10 22	11 3 8	28
" " 30—New Glenloth Co.—Royal Tiger	7 0 0	1 12 2	5 3 0	14⅔
" " 31—Walsh	5 0 0	4 4 12	14 8 7	57½
" " 32—Lone Hand (Simmons and Kavanagh)	70 0 0	108 16 12	375 5 1	107
" " 33—New Glenloth Co. (Fabian's No. 3)	32 0 0	39 17 14	131 14 0	82
" " 34—Leahy and Bayly	8 10 0	8 0 16	25 0 2	65
" " 35—Collins	8 0 0	6 2 0	19 15 6	49
" " 36—New Glenloth Co. (Fabian's No. 3)	50 0 0	48 16 19	164 19 11	66
" " 38—Harp of Erin	27 0 0	16 6 1	59 15 9	44
" " 40—Lone Hand	74 0 0	153 0 8	523 0 7	141½
Total.....	343 10 0	424 2 22	1,451 19 8	83
Grand total to June 30th, 1909....	1,774 0 0	1,576 0 9	5,353 9 7	60⅓
TARCOOLA.—Government Battery and Cyanide Plant.				
Government Mine	5 5 0	35 4 12	114 7 6	436
Total	5 5 0	35 4 12	114 7 6	436
Grand total since starting of battery ..	2,056 10 0	2,544 16 8	8,987 9 2	87⅓

RETURNS FROM CRUSHING PLANTS (OTHER THAN GOVERNMENT) FOR THE HALF-YEAR ENDED JUNE 30TH, 1909.

Name.	Ore Treated.			Total Gold Recovered.			Value.			Average Yield per Ton, in Shillings.
	Tons	cwts.	qrs.	Ozs.	dwts.	grs.	£	s.	d.	
TARCOOLA BLOCKS COMPANY'S BATTERY.										
Battery treatment	185	0	0	383	0	0	957	0	0	103
Total	185	0	0	383	0	0	957	0	0	103
Grand total since starting of Tarcoola Blocks Company's battery, May 16th, 1901, to June 30th, 1909	27,033	0	0	37,611	0	0	116,579	0	0	86
KING'S BLUFF BATTERY, NEAR OLARY.										
Battery treatment— From dump	100	0	0	25	0	0	86	0	0	17
" shaft	144	0	0	160	0	0	549	0	0	77
Total	244	0	0	185	0	0	635	0	0	52
COMMONWEALTH (WHEAL ELLEN) BATTERY, NEAR STRATHALBYN.										
Battery treatment	1,310	0	0	262	8	0	847	0	0	—
Total	1,310	0	0	262	8	0	847	0	0	13

TOTAL BATTERY AND CYANIDE RETURNS FROM ALL PLANTS FOR THE SIX MONTHS ENDED JUNE 30TH, 1909.

Name.	Ore Treated.			Total Gold Recovered.			Value.			Average Yield per Ton, in Shillings.
	Tons	cwts.	qrs.	Ozs.	dwts.	grs.	£	s.	d.	
Mt. Torrens Government Battery	65	14	0	72	6	18	287	14	10	87½
Glenloth " ..	343	10	0	424	2	22	1,451	19	8	83
Petersburg " ..	164	17	0	353	8	5	1,378	12	2	167
Tarcoola " ..	5	5	0	35	4	12	114	7	6	436
Tarcoola Blocks Co.'s Battery	185	0	0	383	0	0	957	0	0	103
King's Bluff Company "	244	0	0	185	0	0	635	0	0	52
Commonwealth (Wheal Ellen) Battery	1,310	0	0	262	8	0	847	0	0	13
Total	2,318	6	0	1,715	10	9	5,671	14	2	49

NORTHERN TERRITORY OF SOUTH AUSTRALIA.

ARLTUNGA, MACDONNELL RANGES.—Government Battery and Cyanide Plant.

The Macdonnell Ranges, although within the boundaries of the Northern Territory, and coming under the operation of the Northern Territory Mining Act, yet geographically belongs to South Australia proper All business is done from Adelaide, and the administration of the Mining Act south of the 19th parallel of latitude is conducted by the Hon. Minister controlling the Northern Territory, with the help of a resident warden at Arltunga.

Name.	Ore Treated.			Total Gold Recovered.			Value.			Average Yield per Ton, in Shillings.
	Tons	cwts.	qrs.	Ozs.	dwts.	grs.	£	s.	d.	
White Range—Luce's	23	7	0	33	12	1	114	8	6	97
Various	3	19	0	3	2	12	6	12	0	33
White Range, Extended	8	4	0	17	15	2	62	12	4	152
Argent	14	13	0	7	0	11	10	17	8	15
White Range, Luce's	15	14	0	29	15	4	100	18	10	128
" "	5	3	0	5	15	17	20	16	7	81
" "	7	3	0	16	7	15	59	14	1	168
" Great Western	4	1	0	4	8	9	15	1	2	73
Argent	4	15	0	2	15	18	5	12	10	23
White Range, Luce's	3	5	0	8	10	3	28	15	5	173
" "	18	0	0	6	10	1	22	12	11	25
Experiment No 2	3	16	0	0	11	1	1	15	0	9
White Range, Luce's	4	10	0	5	14	21	21	8	11	95
" "	9	2	0	31	3	5	112	9	11	247
" Extended and Luce's	9	11	0	10	11	20	35	2	9	73
" Excelsior	5	4	0	7	15	19	29	0	11	93
" Luce's	4	5	0	1	15	18	6	3	6	29
" "	3	7	0	2	13	16	9	7	10	55
" Extended	8	12	0	24	1	14	85	7	1	198
" Luce's	9	6	0	23	14	4	87	12	5	188
" Associated	9	7	0	9	6	13	34	8	6	73
" Great Western	5	12	0	4	17	20	17	7	4	62
" Luce's	7	0	0	10	10	9	38	3	9	109
" Excelsior	9	2	0	6	5	17	23	10	9	52
" Extended	7	5	0	9	1	6	32	16	8	93½
" Luce's	4	18	0	6	0	6	21	14	7	88
" Extended	28	0	0	49	0	10	184	14	1	132
" Luce's	9	14	0	14	13	3	53	4	10	110
" Extended	9	0	0	10	11	7	37	1	10	82½
" "	8	2	0	10	8	20	38	13	9	83½
Total	270	18	0	390	18	7	1,378	6	6	102
Grand total since starting of battery to June 30th, 1909	10,067	5	3	12,449	10	4	46,1	0	9	4	92

WINNECKE'S DEPOT GOVERNMENT BATTERY, MACDONNELL RANGES.

Parcel No. 20—Golden Junction	4	16	0	7	0	15	26	15	1	111
" " 21 "	7	5	0	4	1	13	16	2	2	44
" " 22—Big Gun	5	5	0	4	11	21	17	2	6	61
" " 23—Coronation	8	0	0	3	1	20	10	0	2	25
" " 24 "	5	10	0	4	3	8	15	3	5	55
" " 25—Reward and Junction	5	10	0	3	4	10	12	5	10	44
" " 26—Coronation	26	0	0	14	6	3	53	18	10	41½
" " 27—Reward	8	0	0	8	5	8	31	17	0	79½
" " 28—Black Prince	3	15	0	1	12	21	6	1	6	32½
Total	74	2	0	50	7	23	188	6	0	51
Grand total	337	17	0	164	12	6	616	13	3	37

GOVERNMENT BORING OPERATIONS.

No. 1 Government drill has done 1,191ft. during the half-year. The No. 6 bore at Wandilta was continued from 77ft. (*vide* page 16, "Review" No 9) to 827ft.; the plant was then taken down and removed to the Kadina lease. No. 1 bore was started, and had reached a depth of 441ft. on June 30th.

No. 6 bore, Wandilta (completion).

77ft	Sandstone mixed with	336ft. 8in.	
to	quartz and ironstone	to	Blue country rock
86ft.	veins.	350ft.	
	A broken formation con-	to	Calcite
to	sisting of calcite, quartz-	351ft. 5in.	
	ite, quartz, and ironstone	to	Country rock
106ft.	seams	364ft.	
to	Calcite mixed with iron-	to	Calcite showing sulphide
169ft.	stone seams	365ft. 6in.	Hard blue country rock,
to	Country rock	to	with small bands of cal-
209ft. 7in.			cite, which all showed a
to	Calcite showing a little	743ft.	little mineral
261ft. 7in.	mineral	to	Solid sulphide
to	Blue country rock	743ft. 3in	
318ft.		to	Country rock
to	Calcite	762ft.	
320ft.		to	Sulphide showing
to	Blue country rock	763ft.	
336ft.		to	Clean country rock
to	Calcite showing sulphide	827ft.	Bore discontinued.
336ft. 8in.			

No. 1 bore, Kadina—Angle of bore, 84°.

Surface		75ft.	
to	Loam, limestone boulders,		Broken country rock, with
48ft.	and sandstone	to	small seams of calcite
to	Brown country rock and		
75ft.	felspar	441ft.	Bore in progress.

HALF-YEARLY REPORT OF MINING OPERATIONS ON THE WANDILTA GOVERNMENT MINE, KADINA.

By the Foreman (Mr. A. W. Matthews).

During the half-year the development work has been confined to sinking. The shaft which was originally 6ft. by 4ft. was cut down and enlarged to 11ft. by 4ft. 6in. within timbers, also close timbered and centred into three compartments—two hauling and one pump. Ladder solars, ladders, &c., have also been fixed This work was necessary before sinking below water level could be started. An up-to-date plant has also been installed, consisting of double cylinder winding winch, 25 horse-power Cornish boiler, with necessary feed pump, fittings, &c. A substantial set of Oregon poppet heads 50ft. high has also been erected over the shaft, also blacksmith's shop, engine and boiler-house, changing-room, &c.

One Marsh sinking pump was put in the shaft, and afterwards two more were added. It was thought the water would not be very heavy until the 200ft. level was reached, but unfortunately this has not been the case, as the water came in very strongly directly we met the lode formation at 68ft., and has been making up to 240,000galls. in the 24 hours. Water launders have been fixed and races cut to carry away the water from the workings. The shaft has been sunk 40ft., total 100ft. At 68ft. a strong calcite formation mixed with ironstone and quartz was met, and has continued in the shaft to present depth. This formation carries rich seams of grey and green ore, also red oxide, and is the continuation of the lode formation driven on at the 60ft. level.

The sinking has been retarded owing to the heavy inflow of water. This water is very mineralised, and eats out the columns of the pumps very quickly. This, although counted a good sign as regards ore bodies, causes numerous delays. Also in order to cope with such large quantities of water it is necessary to drive the Marsh pumps above their proper speed, and consequently breakdowns are more frequent than would otherwise be the case with a less number of strokes per minute. To continue sinking with the present pumps the progress will be slow on account of the reasons stated, as the quantity of water we are dealing with is sufficient to keep a 12in. lift at work.

In conclusion, I may state that I have every confidence in the future prospects of the mine, and should it be found necessary to put in a larger pump to cope with the water would have no hesitation in recommending expenditure on same, as the prospects obtained in the shaft up to date, taken in conjunction with the 34ft. of lode cut in No. 5 bore, fully warrant it.

INSPECTION OF QUARRIES.

In consequence of the appalling frequency of serious accidents occurring at quarries the Legislature passed an Act, No. 858 of 1904, bringing quarries in the same category as mines as regards the controlling hand of the Inspector of Mines. Where necessary, quarries have been visited by the Chief Inspector (Mr. W. H. Matthews), who, in some cases, found additional precautionary measures necessary. His requisitions in this respect have in all cases been complied with.

SUBSIDIES.

The Legislature provided in the Mining Act, 1893, and in previous measures for the encouragement of Mining.

The following schedule shows what subsidies have been paid from the inception of the system to June 30th, 1909, and the sums repaid. In the ordinary way these repaymeuts are made from profits—50 per cent. of such profits being devoted to repayments. In two instances only have the profits won enabled full repayment to be accomplished—the Crystal Mine, at Echunga, which repaid £76 7s. 6d. from that source, and the once-famous New Alma and Victoria Mine, Waukaringa, which repaid in full the first subsidy, £3,000. The remainder of the recoveries was derived from sales of mining plant held as security. The total subsidies advanced is £49,243 13s. 7d., of which £6,091 13s. 6d. has been recovered, leaving a debit balance of £43,152 0s. 1d. Portion of this outstanding debt is represented by machinery that has fallen into the hands of the Government; add to this the value of the metals won, and the State in general will probably have benefited beyond the money value of the debit balance.

ENCOURAGEMENT OF MINING.—STATEMENT OF SUBSIDIES PAID FROM COMMENCEMENT TO JUNE 30TH, 1909.

Locality.	Name of Company or Person to whom Subsidy Granted.	Amount Advanced.	Amount Repaid.
		£ s. d.	£ s. d.
Algebuckina	Algebuckina Gold Mining Syndicate	52 10 11	52 10 11
Barndioota, Hundred of	Warrakimbo Propy. Copper Mining Synd...	154 10 8	—
Barossa	Barossa Enterprise Gold Mining Co.	232 2 6	—
"	Enterprise Copper Mining Co., N.L.	150 0 0	9 16 0
"	Enterprise Excelsior (Barossa Amalgamated)	2,000 0 0	—
"	Lady Alice Gold Mining Co.....	1,797 2 3	—
"	Victoria Hill Amalgamated Gold Mining Syn.	38 12 6	—

ENCOURAGEMENT OF MINING.—STATEMENT OF SUBSIDIES PAID—*continued.*

Locality.	Name of Company or Person to whom Subsidy Granted.	Amount Advanced.			Amount Repaid.		
		£	s.	d.	£	s.	d.
Bimbowrie	Mount Victoria Mine	50	0	0	—		
Blackwood	Mount Malvern Silver Mining Co.	491	3	6	—		
Blinman	Nilpena Copper Mining Co., Ltd.	290	5	3	—		
Burr Well	Paull's Consolidated Copper Propy., N.L.	525	0	0	—		
Callington	Callington Copper Mining Co.	148	8	7	—		
"	Paringa Mining Syndicate	399	16	8	244	0	0
"	Paringa and West Kanmantoo Consolidated Copper Mine, N.L.	500	0	0	—		
"	Pioneer Gold and Copper Mining Syndicate	95	15	6	—		
Clarendon	Mount Malvern Silver-lead Mining Co., N.L.	1,347	15	3	—		
Currency Creek	Currency Creek Copper Mining Co.	28	6	5	—		
Echunga	Crystal Gold Mining Co.	563	17	6	176	7	6
"	Wolters, F. C., & Co	25	0	0	—		
"	Echunga Proprietary Hydraulic Gold Sluicing Co., N.L.	500	0	0	20	0	0
Ediacara	Ediacara Consols Silver Mining Co., N.L.	651	12	1	375	17	0
Farina	Warra Warra Propy. Copper Mines, N.L.	322	4	11	322	4	11
Fifth Creek	Fifth Creek Central Silver and Copper Mining Co., N.L.	253	2	4	—		
"	Stainbank, A. T.	70	14	11	—		
Fortress Hill	Fortress Hill Mining Syndicate	60	0	0	—		
Glenloth	Glenloth Mining, Battery, & Options Co., N.L.	515	4	7	515	4	7
"	Glenloth Wells Pioneer Blocks Co., Ltd.	100	0	0	22	18	5
"	Hakendorf, C. H., and Williams, J. (Glenmarkie Mine)	200	0	0	—		
Glen Osmond	Eagle Silver Mining Co., Ltd.	500	0	0	—		
Gumeracha	Gumeracha Gold Mining Syndicate	75	0	0	—		
"	Watt's Gully Gold Mining Co.	50	0	0	—		
"	Watt's Gully Reef Claims	50	0	0	—		
Hahndorf (near)	Mount Pangæus Gold Mining Co.	56	1	4	—		
Kadina	Copper Hill Mining Co., N.L.	391	15	0	—		
"	Wallaroo Central Mining Co., N.L.	500	0	0	—		
"	Polmear, W. J. L.	544	6	9	—		
Kangaroo Island	Kohinoor Gold Mining Co., N.L.	137	17	0	—		
"	Kohinoor Mine (H. G. Taylor)	162	3	0	—		
Kuitpo, Hundred of	Blackfellow's Creek Gold Mining Co., Ltd.	660	6	7	35	0	0
"	McMurtie's Claims	199	19	11	—		
"	Mount Monster Gold Mining Syndicate	350	0	0	1	0	0
Leigh's Creek	Leigh's Creek South Coal Mining Co., N.L.	95	16	4	95	16	4
Maitland	Parara Mining Co., N.L.	571	3	6	—		
Mannahill	Royal Charlie Gold Mining Co.	153	18	5	—		
"	Victoria Tower Mining Co., N.L.	345	18	9	90	0	0
"	Westward Ho Mine (Dr. H. Dixon)	1,000	0	0	—		
Mochatoona	Hunter Bros. (Lady Millicent Mine)	75	10	4	—		
Mount Fitton	Northern Mining and Smelting Co., N.L.	350	0	0	—		
Mount Grainger	Ireby Gold Mining Syndicate	35	4	3	—		
"	Mt. Grainger Ironclad Gold Mining Syn., Ltd.	21	18	10	—		
"	Heithersay, J., Mt. Grainger Medora Mines	77	7	7	—		
"	New Mount Grainger Gold Mines, N.L.	393	7	1	220	0	0
"	Medora and Grainger Gold Mines Syndicate, N.L.	344	2	2	—		
Mount Pleasant	Duke of Cornwall Gold Mining Syndicate	458	17	4	43	10	0
Mount Torrens	Mount Torrens Gold Mining Co.	1,000	0	0	—		
Musgrave Ranges	Musgrave Ranges Prospecting Association	47	2	0	—		
Mutooroo	Mutooroo Copper and Silver Mining Co., Ltd.	500	0	0	500	0	0
Myponga	Wohler, H., & Co.	20	0	0	—		
Nackara	Nackara Proprietary Copper Mining Co., N.L.	100	0	0	—		
"	Nackara Proprietary Gold Mining Syndicate	100	0	0	—		
Nairne	New Banksia Gold Mining Syndicate	250	0	0	—		
"	North Nairne Gold Mining Co.	500	0	0	—		
New Luxemburg	Mingary Gold Mining Co.	650	0	0	—		
New Luxemberg	Queen Bee Mining Co., N.L.	250	0	0	250	0	0
Olary	King's Bluff G.M. Co., N.L.	200	0	0	—		
Palmer (near)	Bevilaqua & Angel	57	18	0	—		
Port Lincoln	Lady Franklin Syndicate	200	0	0	40	0	0

ENCOURAGEMENT OF MINING.—STATEMENT OF SUBSIDIES PAID—*continued.*

Locality.	Name of Company or Person to whom Subsidy Granted.	Amount Advanced.	Amount Repaid.
		£ s. d.	£ s. d.
Prospecting in north-west of State	North-West and West Australian Pros. Co..	104 9 7	—
Prospecting on proposed line to Queensl'd Border	Wheal Turner Copper Mining Co., Ltd.	1,000 0 0	—
Quorn	Quorn Manganese and Silver Mining Co. ...	10 9 10	—
Sliding Rock	Sliding Rock Copper Proprietary, N.L.	2,000 0 0	5 12 0
Strathalbyn, Hund. of	Commonwealth Silver-lead Co., Ltd.	500 0 0	—
Tarcoola	North-West Prospecting Association, N.L...	150 0 0	—
"	Tarcoola Blocks Gold Mining Co., Ltd.	3,995 5 2	—
"	Tarcoola Enterprise Gold Mining Co., N.L...	100 0 0	19 10 4
"	Tarcoola Proprietary Gold Mines, N.L.	150 4 4	9 15 0
Teatree Gully.....	Teatree Gully Gold Mining and Pros. Assn.	234 5 7	—
Teetulpa	Great Ironclad Gold Mining Co.	218 6 9	—
"	Morning Star Gold Mining Co.	68 4 6	—
"	Nil Desperandum Teetulpa Devt. Co., N.L..	64 14 4	20 5 6
"	Teetulpa Mining and Crushing Co.	349 11 4	—
"	Teetulpa Prospecting Syndicate	49 15 6	—
"	Teetulpa Prospecting Association	14 7 3	—
Wadnaminga	Countess of Jersey Gold Mining Co., N.L...	321 0 0	—
Wallaroo.....	Yelta New Copper Mining Co , N.L.	1,000 0 0	—
"	Hamley Copper Mining Co.	883 9 5	—
Waukaringa	Alma Extended Gold Mining Co.	3,000 0 0	22 5 0
"	Kirkeek's Treasure Gold Mining Co.	691 8 1	—
"	New Ajax Consolidated Gold Mining Co., N.L.	750 0 0	—
"	Rees, R., Ajax Mine	500 0 0	—
"	New Alma and Victoria Gold Mining Co., Ld.	3,000 0 0	3,000 0 0
Winnininnie	Winnininnie Gold & Silver Propy. Co., N.L.	86 3 6	—
Wonna	Golden Point Claims	50 0 0	—
Woodside	Bird-in-Hand Gold Mining Co , Ltd.	3,000 0 0	—
"	Eureka Gold Mining Co., Ltd.	1,500 0 0	—
"	New Era Gold Mining Co., Ltd.	1,000 0 0	—
"	Woodside Boring and Mining Syndicate	422 17 11	—
Worturpa	Backhouse, T. S.	100 0 0	—
"	Worturpa Exploration and Mining Co., Ltd.	800 0 0	—
	Adelaide Crushing, Grinding, and Amalgamating Mill Co.	90 0 0	—
	Totals	£ 49,243 13 7	6,091 13 6

ASSAYS AT SCHOOL OF MINES.

NUMBER OF ASSAYS MADE FOR PUBLIC PURPOSES AT THE SCHOOL OF MINES DURING THE SIX MONTHS ENDED JUNE 30TH, 1909.

	1909.						Totals.
	January.	February.	March.	April.	May.	June.	
Assays for the Warden of Goldfields	19	157	155	13	25	53	422
Assays for the Government Geologist	6	33	4	1	17	1	62
Assays for other Government departments	—	—	—	—	—	2	2
Free public assays	90	134	168	175	132	119	818
Totals	115	324	327	189	174	175	1,304

DECENNIAL RETURN SHOWING OUTPUT AND VALUE OF VARIOUS METALS AND MINERALS PRODUCED IN SOUTH AUSTRALIA SO FAR AS CAN BE ASCERTAINED.

Year.	Gold.		Silver.		Silver Lead Ore.		Copper.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ounces.	£	Ounces.	£	Tons.	£	Cwts.	£
1899	3,893	15,582	—	—	—	—	109,912	406,208
1900	3,721	14,494	—	—	—	17,526	97,727	371,920
1901	4,918	16,613	—	—	1,410	11,357	134,719	468,606
1902	7,231	24,878	—	—	2,680	19,740	136,937	388,162
1903	8,650	28,650	7,986	804	211	1,267	129,812	417,116
1904	17,897	76,025	—	—	—	—	125,560	382,356
1905	10,983	45,853	—	—	—	—	130,959	426,511
1906	8,037	27,000	801	104	—	—	164,160	718,609
1907	5,609	20,540	5,845	780	1,000	11,000	158,620	690,000
1908	2,908	12,300	—	—	900	900	112,554	338,000
Totals....	—	281,935	—	1,688	—	61,790	—	4,607,488

Year.	Copper Ore and Regulus.		Lead.		Ironstone Flux.		Limestone Flux.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Cwts.	£	Tons.	£	Tons.	£
1899	2,892	24,682	7,282	3,782	—	—	—	—
1900	2,367	22,526	7,650	4,382	—	—	—	—
1901	1,866	23,011	1,360	722	—	—	—	—
1902	2,579	42,550	43,507	22,303	—	—	—	—
1903	7,069	54,922	14,408	8,799	84,932	46,712	—	—
1904	3,051	24,597	—	—	46,687	27,091	43,440	6,516
1905	2,563	28,434	1,040	369	84,483	48,577	44,498	4,791
1906	—	—	1,000	550	75,226	33,852	31,940	4,791
1907	—	—	—	—	84,600	38,100	31,100	5,800
1908	—	—	—	—	88,000	39,600	29,500	6,000
Totals	—	220,722	—	40,907	—	233,932	—	27,898

Year.	Phosphate Rock.		Crude Salt.		Other Metals and Minerals.	Total Value.
	Quantity.	Value.	Quantity.	Value.	Value.	
	Tons.	£	Tons.	£	£	£
1899.....	—	—	—	—	1,357	451,611
1900.....	—	—	—	—	411	431,259
1901.....	—	—	—	—	2,219	522,478
1902.....	—	—	—	—	742	498,375
1903.....	1,000	1,000	40,000	12,000	100	571,371
1904.....	3,000	3,000	40,000	12,000	198	531,783
1905.....	5,000	5,000	32,500	13,000	1,261	573,796
1906.....	5,850	5,850	55,000	27,500	2,209	820,465
1907.....	8,000	8,000	75,000	37,500	2,500	814,220
1908.....	11,000	11,000	75,000	37,500	4,500	457,900
Totals	—	33,850	—	139,500	15,497	5,673,258

TERTIARY DEPOSIT. HUNDRED BAROSSA.

Gold, Gem Stones, and Ochre have been found here.

(*Page* 20.

REPORTS FORMING ADDENDA TO THE "RECORD OF MINES."

By the Chief Inspector of Mines (W. H. Matthews).

WANDILTA (*vide* pages 144, Record, 45, Review No. 9, and 16, this issue).—Results obtained by the drill were of such a favorable character that it was deemed advisable to at first sink a small shaft to, if possible, locate the ore bodies passed through with the diamond drill, and ascertain, if necessary, the proper position for a more permanent shaft should the prospects warrant such being sunk. With this object a small prospecting shaft has been sunk to a depth of 60ft., or water-level, and crosscuts driven E. and W. The former has been extended 125ft., and the latter 51ft. from the shaft. A large portion of the material passed through has been broken and disturbed country rock, with, particularly in the E. crosscut, strong calcite formations, some being several feet in width, which doubtless are at the deeper levels the ore-bearing material that has been pierced by the drill operations, but, with one exception, at this shallow level containing metal of little or no value. Slightly E. of the shaft the crosscut disclosed one of the strong calcite formations, rising 5ft. above water-level. On this drives have been made N. and S. At the time of my inspection the N. drive was in 66ft., the S. 41ft., and each showed in places bunches and veins of rich ore, principally in the drive bottoms, ranging from 4in. to 8in. wide, with copper and gold contents of a very satisfactory nature. Also from this level several short prospecting drives, rises, and shallow winzes were made, the latter being from 8ft. to 10ft. in depth; when, in consequence of the influx of water, sinking was discontinued. From various points in the N. and S. workings 10 samples were taken, which gave the following results:—Bunches of ore, N. drive, 3ft. to 12ft. wide—Four samples, from 1dwt. to 3dwts. gold per ton, and from 3·6 per cent. to 18·9 per cent. copper; from winzes S. drive, vein 18in. wide—six samples, from 1dwt. to 8dwts. gold per ton, and from 21 per cent. to 46·1 per cent. copper. It will be seen from the above that the gold and copper contents from the samples taken in the winzes slightly below water-level are of much greater value than those taken above the water-line. The lode formation at this point is of a very irregular and bunchy character, but from its value and general indications cannot be allowed to remain without further exploration. To accomplish this it will be necessary to enlarge the present shaft and erect machinery—a portion of which the Government have on hand—with the object of sinking an additional 100ft., where doubtless the more settled country will be reached and the ore bodies should become more regular and defined. (5-1-09.)

DAY SPRING, NEAR KERSBROOK.—A new find on section 1548, hundred of Para Wirra, the freehold land of T. & W. Scott, situated about 4 miles N.E. from Kersbrook, and slightly over 1 mile E. from the main Williamstown Road, close to a small watercourse, locally known as the Deloraine Creek. A short time ago Messrs. Hewlett and Scanlon secured the permission of the owners to prospect this property, with the right to obtain a lease if their operations proved successful. The site chosen is on the W. slope of a fairly high range, which on the surface gives but very little lode indication beyond its pronounced auriferous nature, the country rocks being of the usual gold-bearing character; but until the surface is removed the presence of quartz lodes or veins is not plainly determined. Up to the present the work done is of a limited nature, consisting of one shaft and two small surface openings, proving the vein or formation 40yds. in length. Beyond this the vein matter is apparently overlaid with alluvial, which will have to be removed previous

to the vein formation being exposed. The shaft has been sunk to the depth of 10ft., disclosing a solid vein of lode matter 18in. wide, striking about N.E. and S.W., consisting of ironstained quartz and gossan, showing free gold with small quantities of pyrites, the latter of which will doubtless increase as depth is attained. At this point the vein formation, instead of continuing its course in a N. direction, apparently abruptly takes a W. course, making the vein matter appear at this point to be from 3ft. to 4ft. wide, or considerably above its actual size as it continues S. The first opening is 16yds. S. of the shaft and 4ft. deep, but at that depth fails to disclose anything of importance beyond a small vein 2in. thick, which may possibly improve as sinking is continued. From two samples taken the gold contents were very encouraging. Twenty-four yards still further S. the second opening is simply the surface removed, and exposing mixed vein matter from 12in. to 15in. wide, being principally of similar material to that described in the shaft. Up to the present 4½ tons of stone have been treated at the Government Cyanide Works, Mount Torrens, which yielded slightly over 3ozs. 7dwts. of gold per ton; and at the time of my visit there were 5 tons of ore waiting treatment at the Government Cyanide Works and 2 tons raised on the property, which the owners anticipate will yield good returns. Eleven samples were taken from the shaft and surface openings, which gave the following results:—

		Gold. oz.	dwts.		Silver. dwts.
No. 1.	Ferruginous quartz, S. end of shaft ...	4	8	..	3
No. 2.	" " ...	9	5	..	5
No. 3.	" " ...	5	2	..	4
No. 4.	" centre of shaft ...	5	5	..	4
No. 5.	" centre of shaft ...	8	0	..	5
No. 6.	" N. end of shaft...	2	7	..	Trace
No. 7.	" N. end of shaft...	3	16	..	2
No. 8.	" first opening 16yds. S. of shaft.....	0	2	..	Nil
No. 9.	" opening 16yds. S. of shaft	0	15	..	Trace
No. 10.	" second opening 40yds. S. of shaft	1	8	..	Trace
No. 11.	" second opening 40yds. S. of shaft	3	4	..	2

The 11 samples taken on the line of lode extending 40yds. in length gave an average result of 3ozs. 10dwts. of gold per ton, seven of which were taken from the shaft and returned an average of 5ozs. 9dwts., which, with the crushing, must be regarded as highly satisfactory, and shows that the gold is well distributed through the vein matter at the various points where the formation has been exposed. In regard to its permanency, until further explorations are accomplished it would be premature to express an opinion on that point. The developments so far are most encouraging, and from the appearance of the high rugged hills that surround the locality and the nature of the country rocks, which are of a gold-bearing character, it is evident that there is a large belt of gold and mineral bearing country that should be explored with reasonable chances of success. Great care should be taken to follow up the slightest favorable indications similar to those which have resulted in the present find. (3–4–09.)

By the General Assistant (L. C. E. Gee).

COMMODORE, FORMERLY PRINCE ALBERT (*vide* page 187, Record).—Situated about 2 miles E. from Giles' Nob, and 30 miles by track from both Olary and Mannahill railway stations. Three shafts were sunk here about 21 years ago, and a fair quantity of high-grade silver-lead ore removed. At the present time work has been resumed, and stoping is in progress at the workings from an old shaft, which

has been sunk about 30ft. vertically, and thence about 10ft. on a S. underlie to the footwall of the lode; thence a drive, or diagonal crosscut, has been made S. along the lode for about 25ft. This is all in lode matter, and no hanging-wall disclosed. About half-way along a rise has been put up, and stoping is now being done here on a working face of 7ft., from what is apparently the hanging-wall, and no sign of footwall. The lode consists of quartz and ironstone, carrying a fair proportion of galena and carbonate of lead. It is evidently very large, but the exact width at any point cannot yet be determined, as hanging and foot walls have not so far been disclosed in positions to measure. The general strike is N.E., with an irregular dip S.E. About 20yds. S. of the shaft the lode outcrops, and at about 5 chains N.E. the lode is disclosed in another shaft. The country rock is easily-worked schist; good country for a lode to "live" in. A short distance to the S. of the working shaft a vertical shaft exists, 80ft. deep, with a crosscut from the bottom of, it is stated, 147ft. It is from this shaft that the lode should be further determined, and this could be readily done, and at a depth of about 40ft. below the present workings. It seems strange to me that this large lode should have been neglected for so long, as there are great possibilities in it, and it should be tested and determined at depth. Sample of bagged ore gave on assay—silver, 44ozs. 12dwts. per ton; and lead, 38·1 per cent. A general sample across the 7ft. face of the stope gave—gold, trace; silver, 6ozs. 5dwts. per ton; lead, 27·8 per cent.

The Lux (*vide* page 237, Record; pages 28, Review No. 9, and 27 this issue).—By a shaft not far from the old main shaft an auriferous quartz reef, showing in places a little green carbonate, has been opened up to a depth of 54ft. on an underlie of 60° to the N.W., following the footwall, the general strike being N. 65° E. This shaft is close to the one sunk by the old Lux Company, in which the reef seems to have been entirely missed. At the bottom the reef shows 4ft. wide, and the hanging-wall not yet disclosed, and at places down the shaft it was noticed as much as 5ft. wide. It contains many vughs, and rich gold specimens are found from time to time. Thirty-five and a half tons of ore recently treated at the Petersburg Government Cyanide Works, gave 44ozs. 2dwts. 6grs. of gold, valued at £162 3s. 2d. A 40-ton parcel is now being carted to Olary Railway Station, and the prospects may be regarded as being very favorable. (28–4–09.)

By the Inspector of Mines (H. Jones).

Gunyah (*vide* page 119, Record).—One and a half miles N. of Mount Gunson Mine, on the W. arm of Pernatty Lagoon. The principal works carried on at present are near the extreme W. end of the arm, which is comparatively dry. A great number of shallow pits and trenches have been sunk along the lagoon bed E. and W. over a distance of nearly 2 miles, and for 10 chains wide. They are from 6ft. to 20ft. deep, and disclose a large horizontal deposit of copper-bearing material for the full depth sunk in alternate layers of sandstone, with veins and bunches of green carbonates, black oxide, and yellow ore of high grade. The sandstone is invariably soft and friable, and is highly charged with carbonates; but in the crude state it is of low grade, and will not pay to send it away for treatment. The best and highest grade ores are generally found in the joints and vertical fissures of the bed. Some of these fissures can be traced for considerable distances on the lagoon in places, and may, when further developed, prove to be permanent lodes. From the various workings on the lagoon 3,300 tons of copper ore have been extracted, out of which 300 tons were sorted and sent to market, realising £5,000, and the largest portion of the remaining low-grade ore has been treated on the mine by an experimental leaching plant, from which 25 tons of high-grade precipitates were obtained. There is an enormous quantity of low-grade ore available on the property (practically at surface), that could be cheaply worked. The capacity of the present plant should be enlarged, and this could be done at comparatively little cost, which would enable much greater quantities of the ore to be treated on the mine, and should pay well. About ½ mile W. of the lagoon workings

a considerable amount of work has been done by open cuts, disclosing a horizontal formation 8ft. thick, densely impregnated with green carbonates. This appears to be a separate deposit; 39 tons of ore marketed from these workings gave a return of 13 per cent. copper. A sample taken by me from the open cut gave 11·6 per cent. Five samples taken by me from the lagoon working returned from 2·5 per cent. to 43 per cent. copper. The remarkable copper deposit on this property is extensive and exceedingly promising, being horizontal and near the surface; it can be easily and cheaply worked for years, and when the mine is further developed and equipped with the necessary treatment plant it should become a great copper producer and a remunerative concern. (14–10–08.)

The Gun.—Situated adjoining the Mount Gunson. Five vertical shafts have been sunk, within a distance of 4 chains, to a depth of 30ft., and in all of them the ore body was intersected; the deposit is almost horizontal, and is enclosed in hard dolomitic limestone. From the shaft about 1,320ft. of driving has been done in the ore deposit in various directions; the ore body is from 1ft. to 8ft. thick, and consists of ferruginous clay, slate, and gossan, with rich bunches and pockets of carbonates and grey ore. Seventy-five tons of ore have been marketed from the various workings, and, with a little dressing, gave a return of 16 per cent. copper. Two samples taken by me gave—No. 1, 17·4 per cent.; No. 2, 3·4 per cent. copper. Judging from indications in the various workings and the high value of the ore the mine is well worth being further developed. (15–10–08.)

Mount Gunson (*vide* page 91, Record).—A considerable amount of development work has been done, consisting chiefly of open cuts, trenches, and shallow pits, sunk at various points for a distance of 1½ miles by ½ mile wide. In all these a well-defined horizontal bed of copper-bearing material is disclosed from 6ft. to 12ft. thick, in alternate layers of 3in. to 6in. thick, the whole being densely impregnated with green carbonate; and thin veins of grey ore and copper glance occur in the joints and bedding of the strata. A short distance from the smelter the ore deposit is practically on the surface, with only a thin layer of loose sand covering it. A large open cut has been made—100ft. by 60ft. wide and 7ft. deep—where the copper-bearing material is from 5ft. to 6ft. thick, with high-grade green carbonates throughout. This bed of copper-bearing ore appears to be an extensive one, having been operated on in three other places, the furthest point fully ½ mile from the workings, and in all of them it proved to be quite as thick and of the usual value in copper. In Young's open cut, further up the hill, a considerable amount of work has been done on the formation, and a great quantity of ore extracted. From the face of the cutting a tunnel has been extended on the horizontal formation for a distance of 60ft. into the hill, and the ore-bearing material all the way in keeps about the same thickness and value as in the open cut. A sample taken by me from the face gave 9·2 per cent., and one from the mouth of the tunnel 7·4 per cent., copper. The run of ore in the tunnel apparently continues right through the hill and outcrops again on the W. side, at which point a considerable amount of work was carried on in the early days, and a fair amount of high-grade ore obtained. A sample taken from the various dumps gave 11·6 per cent. On the top of the hill, between the two workings, a shaft has been sunk to a depth of 37ft., and at that depth the ore body was intersected, and appears to be the same run of ore as that outcropping on each side of the hill. Driving has been carried in from the bottom of the shaft N. 40ft. and S. 42ft., the formation in each drive being almost level, and from 4ft. to 5ft. thick, with green carbonates all through the matrix. A sample taken from the N. drive gave 5·4 per cent. and one from the S. drive 8 per cent. The water shaft, 45ft. or 50ft. E. of the smelter, has been sunk apparently to a depth of 60ft., and at the 30ft. level a fair amount of driving has been carried on in various directions on a soft ferruginous formation from 2ft. to 4ft. thick, carrying patches and pockets of rich ore. A sample taken from the W. drive 80ft. in gave 7·3 per cent. Between the water shaft and the pumping station, near the lake, a distance of fully half a mile, a great number of costeans and trenches have been sunk to depths of from 4ft. to 10ft. in hard dolomitic country, and in nearly all of these workings small seams and

bunches of high-grade copper ore are showing, but no defined lode. A sample taken from the various dumps gave 9·5 per cent. On the side of the lake, E. of the pumping station, a small pit has been sunk to a depth of 6ft., and there is a little copper ore through the matrix, apparently of low grade. A sample taken from the spoil heap gave 2·7 per cent. The amount of development work done on this property has amply proved that there is a highly promising deposit of copper ore traversing it for a great area, and so near the surface that it can be easily and cheaply worked, and should, with treatment plant on the mine, become a highly remunerative concern. (16–10–08.)

Spanish American (*vide* page 246, Record).—Near Mannahill. The Homeward Bound and Klondyke lodes traverse these blocks. Four underlie shafts have been sunk to depths of from 15ft. to 80ft., disclosing lode material similar to that in the adjoining mines, consisting of ferruginous calcite and quartz of from 3in. to 12in. thick, carrying gold and bismuth. Drives have been made from the main shaft for a distance of 40ft., and little stoping done, the ore treated from the workings yielding from 5dwts. to 1oz. of gold per ton. The mine is well situated on the line of lode, and good results should follow further development. (19–11–08.)

Cutana (*vide* page 28, Review No. 9).—Five miles S. from the Cutana Railway Siding. A well-defined copper lode traverses this property, bearing N.E. and S.W., going down nearly vertically, which has been disclosed in the workings for a length of 60ft. The ore-bearing material consists of ferruginous quartz, with veins and bunches of high-grade carbonates and grey ore, which can be easily dressed up to 35 or 40 per cent. copper. A shaft has been sunk on the formation to a depth of 23ft., and the ore body all the way down is 3ft. wide, carrying good value. Sample taken from the full width of the lode at the bottom of the shaft gave 12·3 per cent. copper. No. 2, from the dressed ore, gave 46·7 per cent. copper, 1dwt. of gold, and 4ozs. of silver per ton. No. 3 sample, taken from the second-class ore, gave 13 per cent. copper, 1dwt. of gold, and 10dwts. of silver per ton. This lode looks highly promising, and, being a true fissure, it will no doubt go down to a great depth, and has every indication, when further developed, of becoming an important copper producer. (25–11–08.)

King's Bluff (*vide* page 223, Record; page 21, Review No. 8; and page 29, Review No. 9).—All operations below surface suspended for a time, pending the erection of an electric pump. The underlie shaft is down to a total depth of 555ft., where an abundant supply of water for all requirements was struck and the reef was intersected, 4ft. wide, I was informed, carrying rich gold. (27–11–08.)

Mineral Claims Nos. 8524 and 8523 (near King's Bluff).— Several prospecting holes have been sunk on these blocks to a depth of from 6ft. to 8ft., disclosing quartz reefs of various widths of from 2ft. to 6ft., bearing E. and W. A parcel of 4 tons of ore treated from these workings gave a return of 3dwts. 17grs. of gold per ton. All the reefs are fairly defined, and can be traced on the surface for a considerable distance, and are well worth being further prospected.

Monazite Show, King's Bluff.—A vertical shaft has been sunk to a depth of 50ft. At the 25ft. level a considerable amount of work has been done on what appears to be a large formation of ferruginous quartz, quartzite, and kaolin, with no defined walls, all carrying a little gold, but not in payable quantities. A sample taken from the 25ft. level gave 3dwts. gold per ton. When further developed the lode may be found more defined and of higher value. A fair amount of alluvial gold has been obtained in the vicinity of these workings by dry blowing. The property is worth being further prospected, and monazite crystals are found from time to time. (27–11–08.)

Claim Half-mile N. of King's Bluff.—Two vertical shafts, 140ft. and 70ft., exist here, part of the workings of the original King's Bluff Mine. At the 70ft. level drives have been made on the lode from both shafts; the lode strikes N.E., is 18in. wide, and consists of quartz and iron, carrying little gold. There are other lodes traversing this property that are well worth prospecting. (27–11–08.)

Anabama.—Situated about 28 miles S.E. of Mannahill. The workings are on comparatively level country, 1½ miles S. of Anabama Hills, and consist of two shafts and open cuts and trenches along the lines of lodes. The various workings, which extend over nearly ½ mile along the strike, disclose three well-defined copper-bearing lodes, striking N.E. and dipping 60° N.W., and consisting of ferruginous quartz, all densely impregnated with carbonates and bunches of grey ore. About 50ft. N.W. of No. 1 lode a vertical shaft has been sunk to a depth of 51ft., and from the bottom a short crosscut has been driven S.E., where the lode was intersected, 2ft. 6in. wide, of quartz and gossan with green carbonates and grey ore. No. 2 shaft has been sunk, the first 20ft. vertically, 40ft. on the underlie, and the last 3ft. of sinking was in country rock. The lode appears to have faulted, and judging from the indications near the break it should be found a few feet back in the footwall. To further prove the formation below the fault a crosscut should be put in S.E. to pick it up, then a drive made on its course to connect with the vertical shaft. That would give a fair amount of backs to operate on, and the mine would be well ventilated. Four chains S.W. of the last workings, in a long trench, the outcrop of No. 1 lode is exposed for a length of 60ft., and here it shows a width of 4ft. of ferruginous quartz, thickly studded with carbonates, grey ore and copper glance. About 90ft. N.W. of the last lode a little work has been done on No. 2 lode, which appears to be well defined, and is 3ft. 6in. wide, showing high value in copper all through the matrix. On No. 3 lode, 40ft. N.W. of No. 2, a shallow hole has been sunk, disclosing ore-bearing material 2ft. wide. Samples taken from 60ft. shaft above the break, lode, 3ft. wide, gave 19·9 per cent. copper, and a sample of dressed ore 29·6 per cent. copper, 1dwt. of gold, and 3ozs. 6dwts. of silver per ton. A picked sample from No. 1 lode gave 40·7 per cent. copper, 5ozs. 17dwts. of silver per ton; and a sample from No. 2 lode vein, 18in. thick, 20·8 per cent. copper and 2ozs. 4dwts. silver per ton. The future prospects of this comparatively new mine are highly encouraging. The three parallel lodes are fairly defined, and have every appearance of continuing down, and judging from what can be seen in the present workings they fully warrant being vigorously developed to a greater depth. (28–11–08.)

Nil Desperandum (*vide* page 29, Review No. 9).—Situated about 15 miles S. from Olary. There are three parallel copper lodes outcropping on the block, striking N. and S., and dipping 70° W. The chief workings consists of open cuts and one shaft sunk to a depth of 30ft. on the middle lode. The ore-bearing material at all exposures is from 2ft. to 3ft. wide, and consists of ferruginous sandstone and slate, with bunches and veins of green carbonate, grey ore, and copper glance. Several tons of ore sent for trea'ment from the various workings, gave a return of from 32 per cent. to 37 per cent. copper. This lode has been proved on the surface for a distance of 120yds., and in all the workings it appears fairly defined, and likely to go down. The present vertical shaft is well situated, and should be continued to test this highly promising lode at greater depth. The other two lodes traversing the block, E. and W. of the one operated on, are showing strong outcrops with copper ore through the matrix. Assays proved the lodes to contain gold up to 4dwts. per ton, and silver up to 3ozs. 8dwts. per ton, in addition to the copper; and a sample from a new lode about a mile N. of workings gave copper 1·2 per cent., gold 1oz. 2dwts., silver 1 oz. 8dwts. per ton. Considering the extent of these copper and gold-bearing lodes, the property appears highly promising, and fully warrants vigorous developmental work being done to further prove them. (21–11–08.)

Trinity (*vide* page 136, Record).—There appear to be three copper-bearing lodes traversing this property, striking N.E. and S.W., and several shafts have been sunk on each of these to depths, judging from the dump, of from 30ft. to 150ft. At different levels in the shafts a considerable amount of driving and stoping has been done and a fair quantity of ore must have been extracted. At the time of my visit no work was in progress, and it appeared as if the mine had stopped working for a considerable time. Three samples taken from the various dumps gave the following results:—No. 1 W. dump, 8·6 per cent. copper; No. 2 N. shaft dump, 9·5 per cent. copper, 2dwts. gold, and 1dwt. silver per ton; No. 3 W. lode dump, 7·6 per cent. (23–11–08.)

Main Shaft and Battery House, Mount Grainger.

Dust Holes, looking South.

Dust Holes, looking North.

(*Page* 26.)

Mutooroo (*vide* page 97, Record, and page 28, Review No. 9).—On the S. end of the property three parties of tributers were working at depths of from 30ft. to 50ft., stoping out ore of fairly high grade. At the N. end two men were employed at the precipitating plant, from which they extract from 3 tons to 4 tons of precipitates per month of 50 per cent. copper. All the work carried on in the large sulphide lode has been suspended for the present. (24–11–08.)

Winckler's Silver-Lead (*vide* page 194, Record ; and page 28, Review No. 9).—A little stoping is carried on at the shallow levels ; 4 tons of ore were recently sent for treatment from these workings, which gave a return of 68·9 per cent. lead and 21·8ozs. of silver per ton. Five tons of the same value ore are on the surface ready for dispatch. (25–11–08.)

Queen Bee (*vide* page 123, Record ; page 20, Review No. 8 ; and page 28, Review No. 9.—From the W. drive, 120ft. level, main shaft, a winze has been sunk to a depth of 70ft., and the lode all the way down is well defined, from 2ft. to 6ft. wide, of ferruginous quartz, with bunches and seams of high-grade copper ore. At the bottom of the winze, driving E. is in progress, and about 30ft. more driving will connect it with the main shaft, when considerable saving will be made in the hauling of the ore from this part of the mine to the surface. (25–11–08.)

Uncle Tom.—Situated ½ a mile E. of Winckler's. The formation traversing this property is fairly defined, and appears to be the continuation E. of the lode operated on in Winckler's. A considerable amount of work has been done along the outcrop by open cuts and shallow sinking to a depth of from 6ft. to 20ft., and in these workings lode material is disclosed 3ft. wide, with small nodules and seams of lead and silver ore through the matrix. The formation looks favorable, and is well worth being further tested. The underlie shaft should be sunk on it down to the more settled country, where there is every chance of it being found solid and much richer. (25–11–08.)

The Mary, or Benowrie (*vide* page 79, Record ; and page 29, Review No. 9).—The principal work carried on was at the 35ft. level from the main underlie shaft, where a drive has been put in for a distance of 25ft. in sulphide ore. At that distance in, a new make of ore was discovered underfoot. A winze was started in it, and at a depth of 11ft. a well-defined footwall was met with. The formation at this point is 14ft. wide of sulphide, with several seams and bunches of black oxide near the footwall ; 20ft. of driving has been done on that portion of the lode, from the bottom of the winze, all carrying high value in copper, and also a little gold and silver. The ore body in this part of the workings is highly promising, being large and defined, and likely to continue down. To work and develop this mine to best advantage use should be made of the vertical shaft, which is down to a depth of 105ft. Cross-cutting should be carried in from that level to intersect the lode and connect it with the present workings, and that would give good ventilation throughout the mine, and make available for stoping over 100ft. of backs, from which the ore could be hauled to the surface at much less handling than is done at present. Samples taken from various parts of the mine gave the following results :—No. 1, from 100ft. level, 14·5 per cent. copper, 12dwts. silver, and 4dwts. of gold per ton ; No. 2, from vein 100ft. level, 32·6 per cent. copper, 18dwts. silver, and 1dwt. of gold per ton ; No. 3, face of drive, vertical shaft, 11·9 per cent. copper, 1oz. 4dwts. silver, and 2dwts. gold per ton ; No. 4, from small vein, vertical shaft, 23·2 per cent. copper, 1oz. 3dwts. silver, and 2dwts. gold per ton ; No. 5, ore dump, 18·7 per cent. copper, 1oz. 5dwts. silver, and 2dwts. gold per ton. (26–11–08.)

Lux (*vide* page 237, Record ; page 28, Review No. 9 ; and page 23 this issue).—An underlie shaft is in progress on a lode formation 40ft. N. of the one operated on in the old Lux workings. The shaft has been sunk to a depth of 18ft., and the lode in the bottom is 6ft. wide, and consists of ferruginous quartz, carrying a little gold and copper. A bulk sample taken from the bottom of the shaft gave 4dwts. of gold per ton and 2·1 per cent. copper. The lode in the bottom of the shaft is well defined and strong, with every prospect of it going down to great depth. The sinking of the present shaft should be continued. (28–11–08.)

New Milo, Wadnaminga (*vide* Record, page 322).—A well-defined lode traverses the block, bearing E. and W. and dipping 27° S. Several underlie shafts have been sunk on the lode at various points along the line. The main working shaft is down 530ft., and is in fairly good order from the surface to the bottom. A considerable amount of driving has been done on the course of the lode both E. and W. at various levels; the ore has been stoped out between the drives, and some thousands of tons of ore must have been extracted. The lode disclosed in the bottom of the shaft and throughout the old workings consists of quartz and iron pyrites, from 9in. to 18in. wide, carrying more or less gold throughout, with very rich patches in places, and especially where the lode is intersected by the cross leaders (called on the field, "indicators"). This appears to be characteristic of all the Wadnaminga lodes. The principal work carried on at present is in the main shaft at the 370ft. level, where driving and stoping are in progress 80ft. W. of the shaft. The lode operated on is 12in. wide of ferruginous quartz, carrying nice gold. Six tons have been sent away from this part of the workings, which were treated at the Government Cyanide Works, Petersburg, and gave a return of 6ozs. 19dwts. of gold. Samples taken from the various levels were assayed at the School of Mines, Adelaide, and gave the following results:—No. 1, from 530ft. level, 4dwts. gold, 10dwts. silver, per ton; No. 2, from 450ft. level, 1oz. 11dwts. gold, 1oz. 6dwts. silver; No. 3, from 450ft. level, 1dwt. gold, 11dwts. silver; No. 4, from 370ft. level, 2dwts. gold, 1oz. 11dwts. silver. (30–11–08.)

Nectar (*vide* pages 241 and 243, Record).—Situated 7 miles from Mannahill. A considerable amount of work was done on the property in the early days from open cuts and shafts sunk to depths of from 12ft. to 40ft., most of which have fallen in, so there was no chance of getting down to examine them. Judging from surface indications there are strong evidences of two parallel lodes traversing the property, striking N.E. and dipping N.W. Apparently little or no work has been done on the property for some years, but recently a prospector started a shaft in the vicinity of the old workings, and is down 10ft. The lode operated on is from 2ft. to 4ft. wide, of calcareous clayslate, with veins of quartz and iron oxide through the matrix. The gold generally occurs in fine particles in these veins. There are also several strong leaders of quartz outcropping, and bearing nearly at right angles to the formations; but these are generally poor in value, except where they junction with the main lode, at which point they are found to carry better gold. Two parcels of ore were recently treated from the present workings at the Government Cyanide Works, Petersburg, and gave good results—3 tons 15cwts. gave 2ozs. 3dwts. of gold per ton, and 2 tons 12cwts. gave 3ozs. 4dwts. of gold per ton. I took two samples, which, on assay, gave the following results:—No. 1, from bottom of present shaft, 10ft. deep, 5ozs. of gold and 1oz. 4dwts. of silver per ton; No. 2, from 5 tons of seconds, 19dwts. of gold and 5dwts. of silver per ton. The development of this very promising lode in a systematic manner is fully justified. A fair-sized underlie shaft should be sunk near the present workings to a depth of 100ft. or more, and drives put in at that level on the course of the lode. Then the ore could be stoped out to better advantage. (30–11–08).

Yorke Valley (*vide* page 157, Record).—Situated 4 miles N.E. from Maitland. A copper lode traverses the block, bearing N.E., dipping N.W. A considerable amount of work has been done from costeans and trenches along the line for a distance of 4 chains, disclosing copper-bearing material more or less for the whole distance. The main working shaft, a little N.W. of the outcrop, has been sunk 30ft. vertical and 134ft. on the underlie, and is equipped with good ladder-way and bucket road from the surface to the bottom. The lode was intersected at the 30ft. level and followed down for 10ft. At that point the formation appears to be split up, one portion entering the footwall at a sharp angle and the other portion continuing down near the hanging-wall. This portion was followed down in the shaft, and appears to have been the poorest part of the lode, judging from what can be seen from the 40ft. level downwards. The footwall portion of the lode is well worth further prospecting near the point of displacement, where there is a reasonable chance of

expecting a good run of ore. At the 141ft. level a drive has been put in 21ft. N.E.; the formation in the face is 5ft. wide, nearly all country, with small specks of yellow ore, but not sufficient to make it payable. At the 70ft. level driving has been carried in N.E. for a distance of 36ft., and the lode is from 2ft. to 3ft. wide, with blue and green carbonates through the matrix. The S.W. drive opposite the last has been extended 40ft.; the formation all the way apparently was poor; near the face on the hanging-wall for a length of 5ft. there is little ore making. Sample from it gave 6·5 per cent. copper and 1dwt. of gold per ton. At the 30ft. level a drive has been extended N.E. on thel ode for a distance of 42ft., where it connects with the air shaft. The formation is from 2ft. to 3ft. wide, carrying small rich bunches of carbonates. The drive S.W., opposite the last, has been extended 100ft., and is connected with No. 2 shaft. The formation all along this drive is from 2ft. to 3ft. wide, of felspar and quartz, with rich pockets of green and blue carbonates. About half-way between Nos. 1 and 2 shafts, at the 30ft. level, a winze has been started, and sunk to a depth of 6ft. in the bottom near the hanging-wall. There is a vein of ore 18in. wide, and a sample from it gave 5·1 per cent. copper. This vein looks promising, and likely to improve at depth. Sinking should be continued to further prove it on to and below the break. A sample taken from the footwall portion on the break gave 5·4 per cent. copper. No. 2 shaft has been sunk to a depth of 50ft., and at the bottom driving S.W. has been carried on for a distance of 30ft., and a little stoping done from that level. The lode in the bottom of the shaft is 18in. wide, carrying blue and green carbonates. A sample taken from near the hanging-wall for 6in. wide gave 11·6 per cent. copper, and a sample from a vein 18in. wide on footwall gave 0·3 per cent. copper, and one taken 10ft. up from the bottom from a vein 18in. wide gave 11·6 per cent. and 4dwts. gold. The footwall in No. 2 shaft, and in all the upper workings, is strongly impregnated with carbonate. A short crosscut should be put in through the present wall to ascertain if there is more ore at the back of it. I was informed that from 50 tons to 60 tons of ore have been taken out of the upper workings, which gave a return of 25 per cent. copper. The present party had a little dressed ore on the surface, and a sample taken from it gave 34·2 per cent. copper and 5dwts. of gold per ton. As far as can be judged from the present workings, all the ore taken out of the mine came from the back (or 40ft. level) upwards, and I am of the opinion that if further prospecting work were carried on near the break it is quite probable that the continuation of the ore body going down would be discovered. (22–12–08).

Great Southern.—On private property, about 1½ miles from Rapid Bay, adjoining and E. of the Wheal Coglin Mine. The principal work done on the property is situated near the top of a high hill 500ft. above sea level, and about 1 mile from the beach, and consists of several shallow open cuts and pits for a length of 15 chains by 7 chains wide, and in all of these workings ore-bearing material is disclosed, showing nice bunches and veins of high-grade galena. Samples of the galena have assayed as high as 77·5 per cent. lead and 15ozs. silver per ton. Three chains from the N. boundary line an underlie shaft has been sunk to a depth of 12ft. in ore-bearing material with no defined walls, consisting of baryta, with specks and bunches of galena through it all. Six chains S. of the last, and near the hilltop, another pit has been sunk to a depth of 8ft., on what appears to be a fairly-defined formation 3ft. wide, striking E. and dipping S., and consisting of ferruginous honeycomb material carrying nice patches of galena, and it is quite possible that this formation will greatly improve in value as depth is obtained. Four chains E., and nearly in a line between the last two workings, three holes have been sunk to a depth of from 3ft. to 4ft., disclosing ore-bearing material for a width of 20ft., and for about 30ft. long, consisting of baryta and calcite, containing nice bunches of galena for the whole space operated on. Silver-lead ore is found over a great area of this property, but so far no defined and payable lode has been discovered. Further to develop and test this promising property a few deep costeans and trenches should be made N. and S. at right angles to the bearing of the strata at various points where the ore is most conspicuous on the surface, which may probably be the means of locating the main ore body that appears to be traversing the block. (22–1–09).

Inspection in Connection with Proposed Smelters at Beltana.

I visited and inspected a large number of mines in the Northern districts, accompanied by Messrs. Wells and Hunter, two representatives of the Northern Smelting Company. Thirty-five copper shows were inspected, all situated within 40 miles of the Northern railway line, detailed reports of which can be seen at the Department of Mines. A great number of these mines have only been partly prospected, while on others a considerable amount of work has been done, and are in a fair way, with but little improvement in the way of working them, of becoming large producers of copper ore. At all the mines visited there was ample evidence of the great difficulty under which mining has to be carried on in the Far North, owing to the great quantity of low-grade ore that accumulates, which is at present unremunerative, because only the high-grade ore will pay to send to market. If some way could be devised to treat the low-grade ore within a reasonable distance of the properties a great saving to the mines would be the result, as that would enable the mine owners to send their ore to market almost in its crude state, and the output of each mine would increase in proportion at least to the amount of ore now wasted in dressing it.

Site for Smelting Works at Beltana.—An inspection was made of several localities within reasonable distance of the railway line, and, after giving due consideration to each place, the most suitable one was selected, which is about 350yds. from the railway station, from which point a branch line with a small gradient could be constructed to the top of the ore bins at comparatively small expense. There is also on the site plenty of room to extend the plant at any time and erect the necessary buildings. An ample supply of water can be had quite close and within 20ft. of the surface. There are many years' supply of firewood within about 5 miles of the proposed site for about 5 or 6 miles along the bed of the Warrioota Creek. There must be some thousands of tons of firewood, partly cut, and consisting mostly of the top parts of large gum trees, left after the sleeper-cutters' departure. The possibilities of the properties inspected are very great in the way of ore, containing as they do such a great number of fairly large and well-defined ore bodies, carrying high values in copper and most of the fluxes required, except sulphide. Judging from the indications at some of the mines sulphide ore could be obtained in sufficient quantities in a short time if those mines that are nearly down to the sulphide zone were sunk deeper, so that operations could be carried on in the sulphide ore bodies. Within 30 miles of the railway line at Beltana, Leigh's Creek, Lyndhurst Siding, and Farina there are a large number of copper mines besides those mentioned in the report, many of them having very large ore bodies, on which a considerable amount of work has been done to shallow levels. A great number of these formations carry high value in copper, and are wide and well defined, and likely to continue down to great depths. There are also a number of low-grade lodes that would pay well to work if there were facilities to treat the ore in the district. Operations on most of them will, no doubt, be resumed as soon as there is a reasonable chance of a market for the lower grade ores. The ore deposits in the district are very extensive, the mines are numerous and a number of them are fairly well developed, and should be in a fair way of supplying a considerable quantity of ore. In others that have only been partly developed the supply of ore from them would be limited for some time, but would gradually increase as the work of opening out the mines is proceeded with. While the development of the mines is in progress, and until they are well opened out, the smelting company should make sure of the necessary supply of ore, either by procuring some of the mining properties themselves or making arrangements with the owners of the large mines to supply the required quantity. (16–3–09.)

Warra Warra (*vide* page 144, Record).—The lode traversing this property has been proved for a length of 400yds. and to a depth of over 130ft., and consists of ferruginous quartz and kaolin, with seams and bunches of carbonates, copper glance, and grey ore. The portion of the lode that contains the most copper is

3ft. wide, near the hanging-wall, and in some parts of the workings copper-bearing material is found for a width of from 12ft. to 15ft., but is mostly of low grade. The formation is fairly defined throughout the workings, and is likely to continue down. The prospects of this mine are exceedingly favorable, and if worked systematically it should become a regular copper producer.

Copper King (*vide* page 45, Record, and page 40, Review No. 9).—A large ferruginous formation which contains bunches and nodules of high-grade carbonates and grey ore traverses this property. The actual width has not yet been determined, but from indications in the various workings it appears fairly extensive, and has a fair prospect of yielding large quantities of ore when further developed, Samples taken gave from 3·6 per cent. to 6·4 per cent. copper.

Warrioota (*vide* page 145, Record, and page 41, Review No. 9).—Shaft-sinking and open-cut workings have disclosed ore-bearing material on this block for a length of over 4 chains. The formation is from 1ft. to 3ft. wide, of soft slate and quartz, with seams and stains of carbonates, apparently of low grade in bulk. A sample taken from ore dump of about 800 tons of seconds gave 2·7 per cent. copper.

The Arkey Warren.—One and a half miles E. of Warrioota. A considerable amount of work has been done on this property. Three lodes have been operated on in the various workings to shallow depths, from which I was told a fair quantity of ore of from 15 per cent. to 25 per cent. was sent to market. Probably, with facilities for the disposal of the ore, mining will be resumed. Sample taken from the N. and S. lode at a depth of 15ft. gave 3·9 per cent. copper, 14dwts. of silver.

Copper Queen (*vide* page 42, Review No. 9).—In the shaft and open workings a copper-bearing lode has been disclosed for a length of 4 chains and to a depth of 84ft. The formation is from 2ft. to 5ft. wide, of soft ferruginous material, with seams and nodules of carbonates, grey ore, and ruby oxide. To secure a constant supply of ore the mine should be opened out by driving both ways on the course of the lode at the bottom of the present shaft. A sample taken in the open cut for a width of 5ft. gave 10·5 per cent. copper.

Black Eagle (*vide* page 43, Review No. 9).—The principal work done on this property consists of two adits put in from the side of the hill in a large deposit of iron and iron oxide, which contains in bulk from 4 per cent. to 6 per cent. copper. Both adits have been connected by a drive 15ft. wide, all in ore. From these workings £804 worth of copper was extracted in five and a half months. The ore occurs in fine particles through the iron oxide, and also in large boulders, and the latter are easily dressed up to 19 per cent. and 20 per cent. copper. Three chains W. of the last workings a pit has been sunk to a depth of 10ft., which discloses a second lode, well defined and 5ft. wide, containing high-grade copper ore. This property in its present stage of development is in a way of producing great quantities of ore containing high values in copper ore and also good flux.

Harvey's Return (*vide* page 62, Record).—A ferruginous copper-bearing lode traverses this property, and has been proved for a length of 4 chains. Three shafts have been sunk, 40ft., 70ft., and 84ft. respectively. Driving and stoping have been carried on from the shafts and a considerable amount of ore extracted, which was dressed up to 20 per cent. The lode is from 18in. to 2ft. wide, and is likely to continue down. This mine should supply a fair quantity of ore when further developed.

J. P. Hill's Claim.—Four and a quarter miles from Beltana. Two shafts have been sunk 40ft. and 60ft. The formation disclosed in the open workings is from 1ft. to 2ft. wide, of ferruginous material, with small seams and stains of carbonates throughout the whole. It looks promising, and when further developed a fair supply of ore may be expected.

Nuccaleena (*vide* page 105, Record).—A considerable amount of work has been done on this property on a large formation of magnetic iron, a little quartz and calcite carrying a fair percentage of carbonates and copper pyrites.

Green Hill (*vide* page 60, Record).—On top of a hill about 200ft. high several prospecting holes have been sunk 6ft. to 8ft., disclosing two parallel ore bodies of from 4ft. to 8ft. wide, with green carbonates fairly disseminated through the whole. They look promising and well worth being further developed. A sample taken from one hole, ore 4ft. wide, gave 3·2 per cent. copper.

Warra Warra West.—Adjoining the Warra Warra on the W., and the lode operated on in that property appears to have continued on its W. course through this block, although not showing on the surface, for a distance of 400ft. A shaft has been sunk to a depth of 20ft. vertical and 40ft. on the underlie, and a fair amount of driving and stoping has been done on the ore body. I was told that about 60 tons of ore had been extracted from the workings, yielding 22 per cent. copper. This is a promising property, and when further developed should produce a fair quantity of copper ore.

O'Donnell's (*vide* page 130, Record).—One and a half miles E. of Leigh Creek. The workings consist of open cuts and several shafts sunk to water-level, which is 25ft. from surface. In these workings a large deposit of ore-bearing material is disclosed, which consists chiefly of soft slates and kaolin, with nodules and bunches of rich carbonates distributed more or less through the whole. A fair amount of ore has been marketed from the mine, yielding from 25 per cent. to 30 per cent. copper. The property is well worth being tested to a greater depth, when probably a defined ore body will be met with.

Holmes' Claim (*vide* page 130, Record).—A considerable amount of work has been done on this block in an open cut 70ft. long and 40ft. wide, disclosing ore-bearing material, consisting of ferruginous sandstone and quartz, with seams and stains of carbonates in the joints and cleavages. Apparently no defined ore body was discovered in the workings, but there are indications of other lodes on the property which are worth a little prospecting work being done to test them.

Matheson's (*vide* page 79, Record, and page 31, Review No. 9).—Three shafts have been sunk, two of them vertically to a depth of nearly 100ft., and one underlie shaft, which has been connected with one of the vertical shafts at the bottom. Driving and stoping have beeen carried on from the underlie at the 70ft. level, and some hundreds of tons of payable ore obtained. The formation operated upon is of soft clayslate and kaolin, with seams and nodules of high-grade carbonates, easily dressed up to 20 per cent. This is a promising mine, and should, when systematically opened out at greater depth, produce great quantities of copper ore.

Mountain of Light (*vide* page 129, Record, and page 21, Review No. 8).—The lode traversing this property has been proved for a length of nearly 3,000ft., and has been operated on at various points along the line to a depth of 60ft. The formation is from 4ft. to 10ft. wide, of soft slate and kaolinised material, with rich veins and nodules of carbonates and grey ore. Some hundreds of tons of high-grade ore were obtained from the 60ft. level upwards, which must have paid well. In all the lower workings the ore body is strong and likely to continue down. There are three men working the mine at present, sinking a winze from the 60ft. level, and they are down 15ft., getting good ore in the bottom, which is easily dressed up to 27 per cent. copper. This property is undoubtedly a highly promising one, but to put it on a high standard as a copper producer some capital will have to be spent in repairing the present main shaft or sinking a new one. The latter would be a very much better course to adopt.

Wild Dog (*vide* page 31, Review No. 9).—The principal workings consist of open cuts and shallow sinking. The ore-bearing material disclosed is ferruginous quartz, quartzite, and slate in two parallel formations, from 4ft. to 6ft. wide each, and 20ft. apart. The ore occurs in seams and bunches of high-grade carbonates and grey ore, a considerable quantity of which was obtained from the shallow workings, giving excellent results. To produce a regular supply of ore shaft-sinking will have to be done and the mine opened out at greater depth.

MOCULTA PHOSPHATE DEPOSIT.

(*Page* 32.)

Victory (*vide* page 138, Record).—The main working shaft on this property is in fairly good order and is nearly 200ft. deep. A considerable amount of driving and stoping has been done at the various levels, and a great quantity of high-grade ore extracted. The lode operated on is from 2ft. to 4ft. wide, with veins and pockets of carbonates, grey ore, and copper glance, easily dressed up to from 20 per cent. to 30 per cent. copper. This mine has stopped working since the Tasmanian Copper Company suspended operations.

Mount Burr (*vide* page 86, Record, and page 33, Review No. 9).—A large amount of copper-bearing material has been disclosed on this property on the various shallow workings for a width of from 3 chains to 4 chains, consisting of ferruginous quartz, sandstone, and kaolin, with seams and patches of carbonates and grey ore throughout. A tunnel has been driven from the side of the hill on a highly promising looking formation 3ft. wide, which contains veins of grey ore and carbonates. Deeper sinking should be done on the property to prove this lode and the other deposits at greater depth. A considerable amount of high-grade ore has been marketed at various times from the workings.

Poona (*vide* page 120, Record ; and page 48, Review No. 9).—Work is carried on at present at the 183ft. level, main shaft. From the W. drive on the S. lode winze-sinking is in progress, and is down a total depth of 60ft., the formation being a wide one. The sinking is carried down in the footwall portion of the lode, which for the first 50ft. of sinking contained but a very small percentage of ore. At the 50ft. level a decided improvement has taken place in the lode. A nice shoot of ore came in from the W., dipping E., and the last 10ft. of sinking has been done in higher grade ore, which appears to be improving as sunk on. In the bottom of the winze at present there are small seams and bunches of yellow ore through the whole formation; and this, I consider, is very encouraging and fully warrants the sinking of the winze to further prove this shoot of ore to a greater depth. The E. drive on the N. lode has been extended to a total length of 147ft. from the shaft. Driving is carried on in the hanging-wall portion of the lode, which is 4ft. wide, 18in. of it carrying nice seams and patches of yellow ore, and it has every appearance of improving both in value and width going E. This drive, when extended about 30ft. more, should intersect the large ore body met with in the higher levels. Both lodes operated on at present are showing decided improvement in value, and when further developed may prove highly payable. A new winding-rope has been placed on the main shaft, and everything is now in good order for carrying on the work. (27–2–09).

Belalie Mine, formerly the Wheal Sarah (*vide* page 150, Record).—Situated near Bundaleer Station. Three copper-bearing lodes traverse the block, striking E. and W., dipping N., and cutting through the country rock at nearly right angles to its bedding. There are strong indications on the surface at various places of other lodes, but so far no work has been done on them. The principal workings are limited to the S. lode, and are situated near the top of a hill 150ft. above the level of the gully, and consist of two shafts and an adit. The adit was started from the W. side of the hill about 30ft. vertically below the top of the shafts, and has been driven 200ft. through country rock. At 90ft., a formation 18in. thick, consisting of quartz and micaceous ironstone carrying a little copper ore was intersected. At 200ft. the main S. lode was cut, and the adit and underlie shaft were connected at a depth of 30ft. from the surface. From the bottom of the shaft at this level driving E. has been done on the course of the lode for a distance of 60ft. The formation along the drive is ferruginous quartz and calcite, with veins and pockets of carbonates and grey ore. About 12ft. E. of the underlie shaft a winze has been sunk in the lode to a depth of 115ft., but these workings could only be examined down to water-level, which is 32ft. from the top of the winze. The lode to that depth is strong and defined, and from 18in. to 24in. wide, of quartz and calcite, with seams and bunches of carbonates, grey ore, and iron pyrites. From the top of the winze W. driving and stoping have been carried in for some distance, and a considerable quantity of high-grade ore obtained. About 96ft. N.

of the underlie shaft and in a line with the winze, a vertical shaft has been sunk to a depth of 150ft., and is 8ft. by 4ft. in the clear. The shaft is full of water to within 60ft. of the surface, and I was told that a crosscut had been put in S. at the bottom of the shaft, the lode intersected, and some driving had been done E. on it for a distance of 70ft. Thirty feet N. of the vertical shaft some work has been done on No. 2 lode, which is 4ft. wide, of calcite and micaceous iron, with stains of carbonate through the matrix. In an open cut working, 80ft. N. of the last-mentioned, No. 3 lode is disclosed, showing a width of 2ft., with a little carbonate all through. At the bottom of the hill a tunnel has been put in a distance of 270ft., and the position is a very suitable one from which to further develop the property. The tunnel should be extended due S. from the present face to intersect the three S. lodes. That would make available about 130ft. of backs on each lode on which to operate, besides draining all the water from the present workings, thereby saving the expense of a pump and pumping for some time. The lodes are true fissures, and have every prospect of continuing down, and, judging from the present workings, they appear to improve in value as depth is attained. The future prospects of this mine are highly encouraging, and fully warrant it being worked and systematically developed. Samples taken from the various workings gave the following results :—No. 1 E. drive, 30ft. level, lode 4ft. wide, 5·5 per cent. copper ; No. 2, W. side of winze, 50ft. level, lode 18in. wide, 12·7 per cent ; No. 3, E. side of winze, 50ft. level, lode 18in. wide, 18·4 per cent. ; No. 4, from No. 3 lode, 2ft. wide and 8ft. deep, 1·3 per cent ; No. 5, from No. 2 lode, 3ft. wide and 6ft. deep, 1·7 per cent. ; No. 6, outcrop of lode, 20 chains E. of workings, 1·8 per cent. ; No. 7, outcrop of No. 1 lode, 20 chains E. of workings, 1·7 per cent. (19–3–09.)

Appeallina (*vide* page 21, Record).—Three shafts have been sunk to depths of 78ft., 105ft., and 175ft. respectively. Driving and stoping are in progress at the 160ft. level on a large calcareous formation from 3ft. to 10ft. wide. The ore occurs in veins and pockets, the veins being from 4in. to 8in. wide, cutting through the formation in various directions, all containing high-grade sulphide ore going from 30 per cent. to 36 per cent. copper after little hand-dressing. There are at present eight men employed, and the output is from 10 tons to 12 tons per month of 30 per cent. ore. The prospects of this mine are highly favorable, and fully warrant it being opened out on a larger scale and the output considerably increased. A sample taken from the 160ft. level, vein 18in. wide, gave 34 per cent. copper, and one from the 160ft. stope gave 23·8 per cent. (2–4–09.)

The Hamley.—Owing to the depressed state of the copper market work on the property has been chiefly confined for the last six months to improving the plant and the carrying on of the most necessary development work. No. 2 shaft has been repaired and put in good working order from the surface down to the 70-fathom level, and a substantial skip-road has been made of 4in. by 6in. timber, faced with 3½in. by ⅜in. iron, which has been put in the shaft from the landing-brace to a little below the 70-fathom level, so that the skip can go under the shoot of the ore bin that has been erected at that point. The shaft has been equipped with poppet heads 45ft. high, and a pair of new winding engines 10in. by 16in., with 3ft. 6in. drums, which have been housed in with a wood and iron building. A trestle tramline 33ft. long and 20ft. high has been erected from the landing-brace to the new ore bin, which has a capacity of 40 tons. A branch line 212yds. long has been constructed from the Hamley line up to the ore bin at the shaft, where the trucks can be filled from the shoot and conveyed from there direct to the dressing plant, at which place a large ore bin has been erected close to the railway line, having a capacity of 120 tons. No. 1 shaft, 420ft. level.—The S. drive between this and No. 2 shaft has been cleaned and a tramline laid, so that in future the ore will be hauled up through No. 2 shaft. The N. drive at this level has been connected by a rise with the 360ft. level. In this rise a large ore body is exposed ready for stoping out. Three hundred and sixty feet level.—Driving N. is in progress here on the course of the new lode, which is 5ft. wide, showing nice seams of sulphide ore all through. From the back of this drive a rise has been put up to the 300ft. level,

making a large block of the lode ready for stoping. Driving S. on the course of the lode has been started at this level to connect with the new hauling shaft, which will greatly facilitate the handling of the ore from this part of the mine, and will also prove the value of the ore body for a considerable length along the lode. Three hundred feet level.—The S. drive at this level has been connected with the new hauling shaft, and a truck road laid from the plant to the present workings. From the back of the N. drive, 100ft. in from the shaft, a rise was started and has been put up a total distance of 30ft. The ore body here is looking well, is from 6ft. to 7ft. wide, and of high grade. When this rise has been completed up to the 240ft. level a highly promising block of ground will be made available to operate on. Two hundred and forty feet level.—From the N. drive, 100ft. in from the shaft, winze sinking is in progress to meet the rise put up from the 300ft. level, and is down a total depth of 3ft. The ore body throughout the present workings appears highly promising, with a considerable quantity of it in sight ready for stoping out. The new addition and alterations to the plant and machinery will cause considerable saving in the future working of the mine, and will no doubt be a great help in making the mine a fairly profitable one when in full operation. (18–5–09.)

(*Vide also* pages 61, Record, and 46, Review No. 9).